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ASSOCIATE EDITOR
FRANK M. CHAPMAN

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Goeldi, Prof. Dr. Emil A., 36 Zieglerstrasse, Bern, Switzerland.....1903
Grandidier, Alfred, 6 Rond-Point des Champs Elysées, Paris.....1883
Grant, William R. Ogilvie, British Museum (Nat. Hist.), Cromwell Road, London, S. W..........1899
Gurney, John Henry, Keswick Hall, Norwich, England..........1883
Harting, James Edmund, Edgewood, Weybridge, Surrey, England..1883
Hayek, Dr. Gustav von, Vienna...............................1884
Hellmayr, Dr. E. C., Neuhauserstrasse 51, II, Munich, Germany...1903
Hennicke, Dr. Carl R., Gera, Reuss, Germany..................1907
Henson, Harry V., Yokohama.................................1888
Herman, Otto, Budapest, Hungary............................1908
Hudson, William Henry, Tower House, St. Luke's Road, Westbourne Park, London, W..........1895

Ihering, Dr. Hermann von, Museu Paulista, São Paulo, Brazil	1902
Knudson, Valdemar, Kauai, Hawaiian Islands	1888
Krukenberg, Dr. E. F. W., Würzburg, Germany	1884
Krüper, Dr. Theobald J., University Museum, Athens, Greece	1884
Legge, William V., Cullenswood House, St. Mary's, Tasmania	1891
MacFarlane, Roderick, Winnipeg, Manitoba	1886
Madarász, Dr. Julius von, National Museum, Budapest, Hungary	1884
Menzbier, Dr. M., Imperial Society of Naturalists, Moscow	1884
Namiye, M., Tokio	1886
Nicholson, Francis, The Knoll, Windermere, England	1884
North, Alfred J., Australian Museum, Sydney, New South Wales	1902
Oates, Eugene William, 1 Carlton Gardens, Ealing, London, W.	1884
Palmén, Dr. J. T., Helsingfors, Finland	1838
Pycraft, W. P., British Museum (Nat. Hist.), Cromwell Road, London, S. W.	1902
Ramsey, E. P., Sydney, New South Wales	1884
Ringer, Frederic, Nagasaki	1888
Rothschild, Hon. Walter L., Zoölogical Museum, Tring, England	1898
Schalow, Herman, Traunsteinerstrasse 2^1, Berlin, W. 30	1884
Sclater, William Lutley, Oldham Priory, Winchfield, Hants, England	1906
Sushkin Dr. Peter, Imperial University, Moscow	1903
Theel, Dr. Hjalmar, University of Upsala, Upsala, Sweden	1884
Tschusi zu Schmidhoffen, Victor Ritter von, Villa Tännenhof, bei Hallein, Salzburg, Austria	1884
Waterhouse, F. H., 3 Hanover Square, London, W.	1889
Winge, Dr. Herluf, University Zoölogical Museum, Copenhagen	1903
Worcester, Prof. Dean C., Manila, P. I.	1903
Zeledon, Don José, Costa Rica	1884

MEMBERS.

Allen, Francis H., 4 Park St., Boston, Mass.	1901
Allen, Dr. Glover M., 16 Louisburg Square, Boston, Mass.	1904
Allison, Andrew, Ellisville, Miss.	1902
Attwater, H. P., Box 697, Houston, Texas	1901
Bailey, Mrs. Vernon, 1834 Kalorama Ave., Washington, D. C.	1901
Bailey, Vernon, 1834 Kalorama Ave., Washington, D. C.	1901
Baily, William L., Ardmore, Pa.	1901
Barbour, Prof. Erwin H., Univ. of Nebraska, Lincoln, Neb.	1903
Bartsch, Paul, Smithsonian Inst., Washington, D. C.	1902
Beebe, C. William, N. Y. Zoölogical Park, New York City	1903
Bond, Frank, 3127 Newark St., Cleveland Park, Washington, D. C.	1901
Braislin, Dr. William C., 556 Washington Ave., Brooklyn, N. Y.	1902

Brooks, Allan, Okanagan Landing, B. C	1909
Bowles, John Hooper, Greyson Hotel, Santa Barbara, Cal	1910
Brown, Herbert, Tucson, Arizona	1901
Bruner, Prof. Lawrence, Univ. of Nebraska, Lincoln, Neb	1901
Bryan, William Alanson, Pacific Scientific Institution, Honolulu, H. I	1901
Burns, Frank L., Berwyn, Pa	1901
Butler, Amos W., 52 Downey Ave., Irvington, Indianapolis, Ind	1901
Cameron, E. S., Fallon, Montana	1910
Cherrie, George K., Mus. Brooklyn Inst., Eastern Parkway, Brooklyn, N. Y	1901
Clark, Austin Hobart, 1726 18th St., N. W., Washington, D. C	1905
Clark, Prof. Hubert Lyman, Museum of Comparative Zoölogy, Cambridge, Mass	1902
Daggett, Frank S., 109 S. Elmwood Ave., Oak Park, Ill	1901
Dawson, William Leon, Blaine, Wash	1905
Deane, Walter, 29 Brewster St., Cambridge, Mass	1901
Dearborn, Ned, Linden, Md	1907
Eaton, Elon Howard, Hobart College, Geneva, N. Y	1907
Evermann, Prof. Barton W., Bureau of Fisheries, Washington, D. C	1901
Finley, William L., Box 198, Milwaukee, Ore	1907
Fleming, James H., 267 Rusholme Road, Toronto, Ontario	1901
Forbush, Edward H., 9 Church St., Westboro, Mass	1903
Fuertes, Louis Agassiz, Cornell Heights, Ithaca, N. Y	1901
Gault, Benjamin True, Glen Ellyn, Ill	1903
Goldman, Edward Alfonso, Biological Survey, Washington, D. C	1902
Hoffmann, Ralph, 11 W. Concord Ave., Kansas City, Mo	1901
Hollister, Ned, U. S. Nat. Museum, Washington, D. C	1910
Howell, Arthur H., 2305 S. Dakota Ave., Washington, D. C	1902
Jacobs, J. Warren, 404 S. Washington St., Waynesburg, Pa	1904
Jeffries, William Augustus, 11 Pemberton Square, Boston, Mass	1901
Job, Rev. Herbert K., 291 Main St., West Haven, Conn	1901
Jordan, Prof. David Starr, Stanford University, Cal	1901
Knight, Ora Willis, 84 Forest Ave., Bangor, Me	1907
Knowlton, F. H., U. S. Nat. Mus., Washington, D. C	1902
McAtee, Waldo Lee, Biological Survey, Washington, D. C	1910
Mackay, George H., 304 Bay State Road, Boston, Mass	1901
Mailliard, John W., 300 Front St., San Francisco, Cal	1901
Mailliard, Joseph, 300 Front St., San Francisco, Cal	1901
Miller, Mrs. Olive Thorne, 5928 Hays Ave., Los Angeles, Cal	1901
Miller, Waldron DeWitt, Amer. Mus. Nat. Hist., New York City	1906
Morris, George Spencer, Olney, Philadelphia, Pa	1903
Morris, Robert O., 72 Temple St., Springfield, Mass	1904
Murdoch, John, Public Library, Boston, Mass	1901
Norton, Arthur H., Mus. Nat. Hist., 22 Elm St., Portland, Maine	1902

Pearson, T. Gilbert, Greensboro, N. C. 1902
Pennock, Charles J., Kennett Square, Pa. 1901
Preble, Edward A., Biological Survey, Washington, D. C. 1901
Rathbun, Samuel F., 217 14th Ave., N., Seattle, Wash. 1902
Rhoads, Samuel N., 218 Rodman Ave., Haddonfield, N. J. 1901
Riley, Joseph H., U. S. National Museum, Washington, D. C. 1905
Rives, Dr. William C., 1702 Rhode Island Ave., Washington, D. C. . .1901
Robinson, Major Wirt, U. S. A., West Point, N. Y. 1901
Seton, Ernest Thompson, Cos Cob, Conn. 1901
Stephens, Frank, Box 13, R. F. D. No. 2, San Diego, Cal. 1901
Strong, Dr. Reuben M., Dept. Zoöl. Univ. of Chicago, Chicago, Ill.1903
Swales, Bradshaw Hall, Grosse Isle, Mich. 1909
Swarth, Harry S., University of California, Berkeley, Cal. 1909
Taverner, Percy A., 55 Elmhurst Ave., Highland Park, Mich. 1909
Thayer, Abbott H., Monadnock, N. H. 1901
Thayer, John Eliot, Lancaster, Mass. 1905
Todd, W. E. Clyde, Carnegie Museum, Pittsburgh, Pa. 1901
Torrey, Bradford, Hotel Upham, Santa Barbara, Cal. 1901
Townsend, Charles H., Aquarium, Battery Park, New York City.1901
Townsend, Dr. Charles Wendell, 76 Marlborough St., Boston, Mass. 1905
Trotter, Dr. Spencer, Swarthmore College, Swarthmore, Pa. 1901
Warren, Edward Royal, 20 West Caramillo St., Colorado Springs, Colo. 1910
Wayne, Arthur T., Mt. Pleasant, S. C. 1906
Wolcott, Dr. Robert H., Univ. of Nebraska, Lincoln, Neb. 1903
Wright, Mrs. Mabel Osgood, Fairfield, Conn. 1901

ASSOCIATES.

[A * indicates a Life Associate.]

Abbott, Clinton, Gilbert, 153 W. 73rd St., New York City 1898
Adams, Wallace, Yuma, Arizona 1901
Adams, Dr. Z. B., 416 Marlborough St., Boston, Mass. 1908
Aiken, Charles Edward Howard, 2 E. Kiowa St., Colorado Springs, Colo. 1898
Aiken, Hon. John, Greenfield, Mass. 1905
Allen, Arthur A., 115 Stewart Ave., Ithaca, N. Y. 1909
Allen, Miss Edith, 859 Prospect Ave., Hartford, Conn. 1906
Allison, Henry, 37 Prospect St., Fitchburg, Mass. 1909
Allison, William B., 7916 Plum St., New Orleans, La. 1905
Ames, J. H., 62 Charles St., Toronto, Ontario 1895
Anderson, Mrs. J. C., Englewood, N. J. 1903

Anderson, Dr. Rudolph M., Am. Mus. Nat. History, N. Y. City....1907
Andrews, Roy C., Amer. Mus. Nat. Hist., New York City........1906
Angell, Walter A., 33 Westminster St., Providence, R. I.........1901
Archbold, Joseph A., 107 Hodge Ave., Buffalo, N. Y.............1903
Armstrong, Edward E., 2148 N. Sawyer Ave., Chicago, Ill.........1904
Arnold, Edward, Montreal, Quebec..........................1894
Arnold, F. E., 284 Pleasant St., East Providence, R. I.............1909
Arnold, Dr. W. W., 504 No. Nevada Ave., Colorado Springs, Colo..1910
Arnow, Isaac F., St. Marys, Ga..............................1903
Avis, Edward, Box 56, Enfield, Conn..........................1908
Babson, W. A., South Orange, N. J............................1901
Bagg, Egbert, 424 Genesee St., Utica, N. Y...................1883
Bailey, Prof. G. A., Geneseo, N. Y.............................1910
Bailey, Harold H., Box 154, Newport News, Va................1903
Bailey, Samuel Waldo, Box 212, Newburyport, Mass............1909
Baird, Miss Lucy Hunter, 341 S. 18th St., Philadelphia, Pa.......1899
Baker, Frank C., Chicago Acad. Sciences, Chicago, Ill............1907
Baldwin, Roger N., 3739 Windsor Place, St. Louis, Mo..........1904
Bales, Dr. Blenn, R., 149 N. Main St., Circleville, Ohio...........1907
Ball, Mrs. Bennet F., Oakville, Conn.........................1905
Ball, Miss Helen Augusta, 43 Laurel St., Worcester, Mass.......1893
Barbour, Rev. Robert, Y. M. C. A., Montclair, N. J.............1902
Barbour, Thomas, Mus. of Comp. Zoölogy, Cambridge, Mass.....1903
Barnard, Judge Job, 1306 Rhode Island Ave., Washington, D. C.....1886
Barnes, Claude T., Box 1199, Salt Lake City, Utah.............1908
Barnes, Hon. R. Magoon, Lacon, Ill..........................1889
Barrett, Harold Lawrence, 704 Centre St., Jamaica Plain, Mass...1909
Barry, Miss Anna K., 5 Bowdoin Ave., Dorchester, Mass...........1907
Baynard, Oscar E., Gainsville, Fla...........................1910
Beck, Rollo Howard, Berryessa, Cal...........................1894
Beers, Henry W., 91 Denver Ave., Bridgeport, Conn............1895
Benner, Franklin, 1960 Kenwood Parkway, Minneapolis, Minn...1909
Bennetts, William J., 1941 1st St. N. W., Washington, D. C.....1901
Bergtold, Dr. W. H., 1159 Race St., Denver, Colo..............1889
Berier, de Lagnel, 145 Buena Vista Place, Ridgewood, N. J........1885
Berry, Mrs. S. Jennie, 633 Waterloo St., London, Ont............1909
Betts, Norman de Witt, Forest Service, Boulder, Colo...........1908
Biddle, Miss Emily Williams, 2201 Samson St., Philadelphia, Pa..1898
Bigelow, Albert F., 84 State St., Boston, Mass.................1910
Bigelow, Henry Bryant, Concord, Mass.......................1897
Bigelow, Homer Lane, Old Orchard Road, Chestnut Hill, Mass....1902
Birdseye, Clarence, Biological Survey, Washington, D. C.........1908
Blackwelder, Eliot, Univ. of Wisconsin, Madison, Wis..........1895
Blain, Dr. Alex. W., Jr., 1105 Jefferson Ave., E., Detroit, Mich...1901
Blain, Merrill W., 1321 Glendale Ave., Tropico, Cal............1910
Blake, Francis G., Blanchard, Maine..........................1901

Blake, Maurice C., Thacher School, Nordhaff, Cal..............1907
Blake, Sidney F., 38 Walnut St., Stoughton, Mass...............1910
Blatchley, W. S., 1530 Park Ave., Indianapolis, Ind.............1895
Bloomfield, Mrs. C. C., 723 Main St., W., Jackson, Mich.........1901
Boardman, Miss E. D., 416 Marlborough St., Boston, Mass.........1906
Bogardus, Miss Charlotte, Elm St., Coxsackie, N. Y............1909
Bogert, William S., Box 53, Leonia, N. J.......................1904
Bohlman, Herman T., 202 Occident St., Portland, Ore............1901
Bolt, Benjamin Franklin, 1421 Prospect Ave., Kansas City, Mo...1909
Bond, Harry L., Lakefield, Minn...........................1908
Bosson, Campbell, 27 Hereford St., Boston, Mass................1906
Boudinot, Mrs. H. R., 302 Rusholme St., Davenport, Iowa.........1909
Bowdish, B. S., Demarest, N. J..............................1891
Bowdish, Mrs. B. S., Demarest, N. J..........................1902
Bowditch, Harold, Mass. General Hospital, Boston, Mass.........1900
Boyd, Trustin B., Kirkwood, Mo..............................1908
Bracken, Mrs. Henry Martyn, 1010 Fourth St., S. E., Minneapolis, Minn..1897
Bradford, Mrs. J. L., 1628 State St., New Orleans, La..............1897
Bradford, Moses B. L., Concord Public Library, Concord, Mass.....1889
Bradlee, Thomas Stevenson, Somerset Club, Boston, Mass.......1902
Brainerd, Dr. John B., 57 Monmouth St., Brookline, Mass.........1909
Brandreth, Courtenay, Cliff Cottage, Ossining, N. Y............1905
Brandreth, Franklin, Cliff Cottage, Ossining, N. Y..............1889
Brewster, Edward Everett, 316 East C St., Iron Mountain, Mich.1893
Bridge, Edmund, 52 Wyman St., West Medford, Mass............1910
Bridge, Mrs. Edmund, 52 Wyman St., West Medford, Mass.........1902
Bright, Miss Anna L., Green Hill Farm, Overbrook, Pa...........1903
Brimley, H. H., Raleigh, N. C...............................1904
Bristol, John I. D., 45 West 74th St., New York City............1907
Brock, Dr. Henry Herbert, 687 Congress St., Portland, Me......1894
Brooks, Winthrop S., Shirley, Mass..........................1907
Brooks, Rev. Earle Amos, Weston, W. Va.....................1892
Brown, Arthur L., 217 Spring St., West Roxbury, Mass...........1908
Brown, C. Emerson, Boston Society Natural History, Boston, Mass.1908
Brown, Edward J., U. S. Nat. Museum, Washington, D. C.........1891
Brown, Hubert H., 72 Gothic Ave., Toronto, Ontario............1889
Brown, Stewardson, 20 E. Penn. St., Germantown, Philadelphia, Pa.1895
Bruen, Frank, 65 Prospect St., Bristol, Conn..................1908
Bryant, Miss Alice de V., Cohasset, Mass......................1910
Bryant, Owen, Cohasset, Mass..............................1903
Bumpus, Dr. Hermon C., University of Wisconsin, Madison, Wis....1901
Burgess, John Kingsbury, Chestnut St., Dedham, Mass.........1898
Burke, Wm. Bardwell, 130 Spring St., Rochester, N. Y..........1901
Burnett, William L., Box 337, Loveland, Colo.................1895
Burt, H. P., 355 Union St., New Bedford, Mass..................1908

Burtch, Verdi, Branchport, N. Y. 1903
Butler, Miss Charlotte W., 500 Audubon Road, Boston, Mass... 1904
Buxbaum, Mrs. Clara E., St. Joseph, Mich....................... 1895
Cabot, Louis, Brookline, Mass................................. 1904
Caduc, Eugene E., 14 Derne St., Boston, Mass.................. 1910
Callender, James Phillips, 603 Springfield Ave., Summit, N. J... 1903
Carey, Henry R., Milton Academy, Milton, Mass................ 1908
Carpenter, Rev. Charles Knapp, 183 Fox St., Aurora, Ill......... 1894
Carpenter, George I., 696 Halsey St., Brooklyn, N. Y........... 1907
Carriker, M. A., Jr., Amer. Mus. Nat. Hist., New York City...... 1907
Carter, John D., Lansdowne, Pa.............................. 1907
Case, Rev. Bert F., Richmond Beach, Wash...................... 1903
Case, Clifford M., 7 Holcomb St., Hartford, Conn............... 1892
Cash, Harry A., 54 Spring St., Pawtucket, R. I.................. 1898
Caskey, Robert C., 58 Mills St., Morristown, N. J................ 1908
Catlin, James P., Ottawa, Ill.................................. 1905
Chamberlain, Chauncy W., 36 Lincoln St., Boston, Mass........ 1885
Chambers, W. Lee, Box 73D, Los Angeles, Cal.................. 1907
Chapin, Prof. Angie Clara, 25 Freeman Cottage, Wellesley, Mass... 1896
Chapin, James, 330 W. 95th St., New York City.................. 1906
Chapman, Mrs. F. M., Englewood, N. J.......................... 1908
Charles, Fred Lemar, University of Illinois, Urbana, Ill......... 1908
Chase, Mrs. Agnes, Dept. of Agriculture, Washington, D. C....... 1896
Chase, Sidney, Nantucket, Mass................................ 1904
Christie, Edward H., 5069 Kensington Ave., St. Louis, Mo....... 1910
Christy, Bayard H., 403 Frederick Ave., Sewickley, Pa........... 1901
Chubb, Samuel H., 3492 Bailey Ave., New York City............ 1894
Clarke, Mrs. Arthur E., Staupe Place, Manchester, N. H......... 1909
Clark, B. Preston, Box 2862, Boston, Mass..................... 1907
Clark, Edward B., Hamilton Hotel, Washington, D. C............ 1900
Clark, Miss Emily L., 103 Main St., St. Johnsbury, Vt........... 1905
Clark, Josiah H., 238 Broadway, Paterson, N. J.................. 1895
Clark, Miss Susan E., 103 Main St., St. Johnsbury, Vt........... 1905
Clarke, Charles E., 21 Curtis St., West Somerville, Mass......... 1907
Clarke, Miss Harriet E., 9 Chestnut St., Worcester, Mass....... 1896
Clarke, Rowena A., Kirkwood Station, St. Louis, Mo............ 1906
Clarke, Dr. Wm. C., 200 W. 56th St., New York City............ 1909
Cleaves, Howard H., Princes Bay, Staten Island, N. Y........... 1907
Cleveland, Miss Lilian, Woods Edge Road, West Medford, Mass.. 1906
Cleveland, Dr. Clement, 925 Park Ave., New York City......... 1903
Cleveland, Wm. Bingham, Burton, Ohio........................ 1909
Coale, Henry K., Highland Park, Ill.......................... 1883
Cobb, Miss Annie W., 301 Mass. Ave., Arlington, Mass............ 1909
Cobb, Stanley, 340 Adams St., Milton, Mass.................... 1909
Codman, Dr. Ernest A., 227 Beacon St., Boston, Mass............ 1909
Codman, John S., Quail St., West Roxbury, Mass................ 1908

Coffin, Miss Lucy V. Baxter, 3232 Groveland Ave., Chicago, Ill..1905
Colburn, Albert E., 744 S. Broadway, Los Angeles, Cal...........1891
Cole, James M., Woodstock, Ontario...........................1909
Cole, Dr. Leon J., 1815 University Ave., Madison, Wis..........1908
Colvin, Walter S., Box 2021, Osawatomie, Kan................1896
Comey, Arthur C., University Club, Milwaukee, Wis............1901
Commons, Mrs. F. W., 2437 Park Ave., Minneapolis, Minn.........1902
Cook, Miss Lilian Gillette, 165 W. 82d St., New York City......1899
Cope, Alban, Butler Hospital, Providence, R. I..................1885
Cope, Francis R., Jr., E. Washington Lane, Germantown, Pa.....1892
Copeland, Dr. Ernest, 302 Goldsmith Bldg., Milwaukee, Wis.......1897
Copeland, Manton, 88 Federal St., Brunswick, Me...............1900
Corey, Miss Alice F., 1111 Park Ave., Plainfield, N. J............1910
Cox, Ulysses I., State Normal School, Terre Haute, Ind...........1894
Craigmile, Miss Esther A., 24 S. Grant St., Hinesdale, Ill.........1910
Cram, R. J., 26 Hancock Ave., W., Detroit, Mich................1893
Crandall, C. W., 10 Third St., Woodside, N. Y..................1891
Crandall, Lee S., 540 W. 146th St., New York City..............1909
Crane, Miss Clara L., Dalton, Mass..........................1904
Crane, Mrs. Zenas, Dalton, Mass.............................1904
Cromwell, James W., Box 246, Summit, N. J....................1904
Crone, John Valetine, Greeley, Colo.........................1902
Crosby, Maunsell S., Grasmere, Rhinebeck, N. Y................1904
Cummings, Miss Emma G., 16 Kennard Road, Brookline, Mass.....1903
Curl, H. C., U. S. Naval Hospital, Canasao, P. I..................1907
Currie, Rolla P., Dept. of Agriculture, Washington, D. C.........1895
Currier, Edmonde Samuel, 416 E. Chicago St., St. Johns, Ore.....1894
Cushman, Miss Alice, 919 Pine St., Philadelphia, Pa.............1910
Cutler, Mrs. Annie F., 117 Washington Ave., Chelsea, Mass......1908
Danielson, Miss Edna H., R. F. D. 3, Goodhue, Minn............1910
Dart, Dr. Leslie O., Curtis Court, Minneapolis, Minn............1898
Davenport, Mrs. Elizabeth B., Lindenhurst, Brattleboro, Vt.....1898
Davis, Charles H., 515 Michigan Ave., Saginaw, Mich...........1906
Davis, Henry C., Cummaquid, Mass...........................1909
Davis, Mrs. Susan L., 139 Park St., Newton, Mass...............1906
Day, Chester Sessions, 15 Chilton Road, West Roxbury, Mass....1897
Day, Frank Miles, Mt. Airy, Philadelphia, Pa...................1901
Deane, George Clement, 80 Sparks St., Cambridge, Mass........1899
DeLoach, R. J. H., University of Ga., Athens, Ga................1910
Dennis, David W., Richmond, Ind............................1907
Densmore, Miss Mabel, Red Wing, Minn.......................1910
Derby, Richard, 925 Park Ave., New York City..................1898
Derby, W. M., Jr., 4857 Kimbark Ave., Chicago, Ill...............1908
Derickson, Mrs. Geo. P., 1760 Hennepin Ave., Minneapolis, Minn..1910
DeVine, J. L., 5478 Ellis Ave., Chicago, Ill.......................1903
Dewey, Dr. Charles A., 78 Plymouth Ave., Rochester, N. Y......1900

Dewing, Thomas W., 82 E. 55th St., New York City..............1907
Dice, Lee Raymond, Prescott, Wash..............................1909
Dickerson, Miss Mary C., Am. Mus. Nat. History, N. Y. City.....1908
Dickey, Samuel S., 31 S. West St., Waynesburg, Pa...............1905
Dille, Frederick M., 2927 W. 28th Ave., Denver, Colo...........1892
Dimick, Chas. W., 1008 Tremont Bldg., Boston, Mass.............1909
Dionne, C. E., Laval University, Quebec, Que....................1893
Dixon, Frederick J., Elm Ave., Hackensack, N. J...............1891
Dodge, Charles W., Univ. of Rochester, Rochester, N. Y.........1900
Dodson, Joseph H., 534 Sheridan Road, Evanston, Ill.............1909
Donoho, Ruger, 130 W. 57th St., New York City.................1908
Dougherty, Gen. William E., 1409 E. 14th St., Fruitvale, Cal.....1890
Draper, J. Sumner, Readville, Mass..............................1908
Drowne, Dr. Frederick Peabody, Chilesburg, Va.................1899
Drummond, Miss Mary, Spring Lane, Lake Forest, Ill.............1904
DuBois, Alex. Dawes, 401 So. Aurora St., Ithaca, N. Y...........1905
Du Bon, James L., Windsor Locks, Conn..........................1909
Dugmore, Arthur Radclyffe, Newfoundland, N. J..................1899
Dull, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.............1900
Dunbar, W. Linfred, Union Metallic Cartridge Co., Bridgeport, Conn..1906
Dunham, Arthur Louis, 6 Holyoke Place, Cambridge, Mass.......1910
Dunn, Miss Harriet A., Box 45, Athol, Mass.....................1909
Durfee, Owen, Box 125, Fall River, Mass........................1887
Dyche, Prof. L. L., Pratt, Kansas................................1886
Dyke, Arthur Curtis, Bridgewater, Mass..........................1902
Earle, Miss Eleanor P., Palma Sola, Fla.........................1910
Eastman, Francis B., Fort Benjamin Harrison, Indiana...........1909
Eastman, Harry D., Framingham, Mass...........................1891
Eaton, Miss Mary S., 8 Monument St., Concord, Mass...........1909
Edson, John M., Marietta Road, Bellingham, Wash...............1886
Edwards, Stanley W., 36 Pearl St., Hartford, Conn..............1907
Ehinger, Dr. Clyde E., 100 Rosedale Ave., West Chester, Pa......1904
Eiche, August, 1133 O St., Lincoln, Neb........................1902
Eifrig, Rev. C. W. Gustave, Addison, Ill........................1901
Eimbeck, Dr. A. F., New Haven, Mo..............................1906
Ells, George P., Norwalk, Conn..................................1904
Elrod, Prof. Morton J., 205 S. 5th St., Missoula, Montana........1892
Embody, George Charles, Butler College, Indianapolis, Ind.......1898
Emerson, L. P., 23 Fairfax Hall, Cambridge, Mass................1908
Emmet, Christopher Temple, Stony Brook, N. Y...................1909
Emmet, Robert T., New Rochelle, N. Y...........................1904
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Elliott, Dr. E. Earl, 63 William St., Lyons, N. Y................1909
Enders, John O., Box 546, Hartford, Conn.......................1904
Eustis, Richard S., 17 Highland St., Cambridge, Mass...........1903

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Evans, William B., 205 E. Central Ave., Moorestown, N. J........1897
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Farr, Marcus S., Princeton University, Princeton, N. J...........1900
Farwell, Mrs. Francis Cooley, Edgewood, Lake Forest, Ill.......1898
Farwell, Mrs. John V., Ardleigh, Lake Forest, Ill................1896
Fay, L. H., Brocton, N. Y......................................1910
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Field, Edward B., 30 Gillette St., Hartford, Conn................1898
Field, Dr. Geo. W., Sharon, Mass...............................1910
Fisher, Miss Elizabeth Wilson, 524 Walnut St., Philadelphia, Pa..1896
Fisher, G. Clyde, Johns Hopkins Univ., Baltimore, Md...........1908
Fisher, Walter T., 52 Plympton St., Cambridge, Mass...........1907
Flanagan, John H., 392 Benefit St., Providence, R. I..............1898
Fletcher, Mrs. Mary E., Proctorsville, Vt.......................1898
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Fordyce, Geo. L., 40 Lincoln Ave., Youngstown, Ohio............1901
Fowler, Frederick Hall, 221 Kingsley Ave., Palo Alto, Cal......1892
Fowler, Henry W., Acad. Nat. Sciences, Philadelphia, Pa.........1898
Fox, Dr. William H., 1826 Jefferson Place, Washington, D. C.......1883
Fraser, Donald, Johnstown, N. Y..............................1902
Frazier, J. F., Audubon, Iowa..................................1909
Freeman, Miss Harriet E., 37 Union Park, Boston, Mass.........1903
Freeman, Dr. Leonard, 1374 Elizabeth St., Denver, Colo..........1909
French, Charles H., Canton, Mass.............................1904
French, Mrs. Teresa I., Canton, Mass..........................1908
Fuller, Clarence J., Elmwood Ave., Bayside, N. Y..............1907
Fuller, Mrs. Ella M., Needham, Mass..........................1909
Fuller, T. Otis, Needham, Mass...............................1904
Futcher, Dr. Thomas B., 23 W. Franklin St., Baltimore, Md.......1906
Gaines, Edward F., Ritzville, Wash............................1908
Gano, Miss Laura, 744 National Road, W., Richmond, Ind........1903
Gardiner, Charles Barnes, 5 Minard Place, Norwalk, Ohio......1903
Garrick, James P., Jr., Weston, S. C...........................1906
Gath, John, Box 236, Torrington, Conn..........................1901
Gibson, Langdon, 5 Union St., Schenectady, N. Y................1904
Gifford, Edward Winslow, Cal. Acad. Sci., San Francisco, Cal.....1904
Gilman, M. French, Sacaton, Arizona..........................1907
Goodale, Dr. Joseph Lincoln, 258 Beacon St., Boston, Mass......1885
Goodell, Mrs. James P., Rhinebeck, N. Y.......................1909
Goodrich, Juliet T., 1210 Astor St., Chicago, Ill.................1904
Goodwin, Miss Amelia M., 10 Follen St., Cambridge, Mass.........1904

Gould, Joseph E., 5 Clifton St., Norfolk, Va.....................1889
Graham, Wm. J., Aledo, Ill.....................................1909
Granger, Miss Helen, Wilder Hall, Amherst, Mass..............1904
Granger, Walter, Amer. Mus. Nat. Hist., New York City........1891
Grant, Mrs. H. T., 187 Bowen St., Providence, R. I..............1909
Grant, Wm. H., Englewood, N. J................................1910
Graves, Mrs. Charles B., 66 Franklin St., New London, Conn.....1905
Greenough, Henry Vose, 23 Monmouth Court, Brookline, Mass...1901
Gregory, Stephen S., Jr., 1349 Astor St., Chicago, Ill.............1906
Griscom, Ludlow, 21 Washington Sq., N., New York City.......1908
Gronberger, S. M., Smithsonian Inst., Washington, D. C.........1909
Gross, Alfred O., 39 College House, Cambridge, Mass..........1907
Hadley, Alden H., Monrovia, Indiana..........................1906
Hales, Henry, Ridgewood, N. J................................1890
Hall, Frank H., Agricultural Experiment Station, Geneva, N. Y...1910
Hall, H. Porter, Leominster, Mass............................1904
Hamilton, Dr. B. A., Highland Park, Ill........................1909
Hankinson, Thos. Leroy, Charleston, Ill......................1897
Hann, Herbert H., Mt. Hood, Oregon..........................1903
Hardon, Mrs. Henry W., 315 West 71st St., New York City......1905
Hardy, John H., Jr., Littleton, Mass...........................1905
Harper, Francis, 557 First Ave., College Point, N. Y.............1907
Harper, Mrs. Mary McC., 102 Pennsylvania Ave., Wilmington, Del.1910
Hart, Charles G., Box 47, East Berlin, Conn...................1908
Harvey, Miss Ruth Sawyer, Bond Hill, Cincinnati, Ohio........1902
Haskell, Miss Helen P., 1207 Henry St., Alton, Ill..............1905
Hathaway, Harry S., Box 1466, Providence, R. I................1897
Havemeyer, H. O., Jr., 113 Wall St., New York City.............1893
Hazard, Hon. R. G., Peace Dale, R. I..........................1885
Heil, Charles E., Needham, Mass.............................1908
Helme, Arthur H., Miller Place, N. Y.........................1888
Henderson, Judge Junius, Boulder, Colo.......................1903
Hendrickson, W. F., 276 Hillside Ave., Jamaica, N. Y...........1885
Henn, Arthur Wilbur, Indian University, Bloomington, Ind.......1909
Henninger, Rev. Walther F., New Bremen, Ohio..............1898
Herrick, Harold, 25 Liberty St., New York City...............1905
Hersey, Luman J., 2121 W. 34th Ave., Denver, Colo...............1909
Hess, Isaac E., Philo, Ill..1909
Higbee, Harry G., 13 Austin St., Hyde Park, Mass..............1900
Hill, James Haynes, Box 485, New London, Conn..............1897
Hill, Mrs. Thomas R., 4629 Baltimore Ave., Philadelphia, Pa.....1903
Hine, Ashley, 615 Isabella St., Edmonton, Alberta.............1909
Hine, Prof. James Stewart, Ohio State Univ., Columbus, Ohio....1899
Hine, Mrs. Jane L., Sedan, Ind................................1890
Hitchcock, Frank H., Metropolitan Club, Washington, D. C.....1891
Hix, George E., 630 Columbus Ave., New York City.............1904

Hodge, Prof. Clifton Fremont, Clark Univ., Worcester, Mass.....1899
Holden, Mrs. Emeline R., 13 E. 79th St., New York City........1902
Holden, Mrs. Edwin B., 323 Riverside Drive, New York City......1903
Holland, Harold May, 5322 Ellis Ave., Chicago, Ill.............1910
Holland, Dr. William J., Carnegie Institute, Pittsburgh, Pa.....1899
Hollister, Warren D., 620 McPhea Bld'g., Denver, Colo.......1901
Holman, Ralph H., 33 Chestnut St., Stoneham, Mass.............1907
Holt, Mrs. Nancy W. C., 136 Chauncey St., Cambridge, Mass.....1908
Honywill, Albert W., Jr., 171 Ellsworth Ave., New Haven, Conn..1907
Horsfall, Bruce, Acampo, Cal..............................1905
Howell, A. Brazier, 250 N. Orange Grove Ave., Pasadena, Cal...1909
Howell, Benjamin F., Jr., R. F. D. 1, Boonton, N. J..............1907
Howe, Carlton D., Essex Junction, Vt.........................1901
Howe, Miss Louise, 53 Linden St., Brookline, Mass.............1908
Howe, Reginald Heber, Jr., Middlesex School, Concord, Mass...1895
Hoxie, Walter J., 1522 Bull St., Savannah, Ga.................1909
Hoyt, Miss Annie S., 121 Madison Ave., New York City, N. Y....1909
Hoyt, William H., Box 425, Stamford, Conn....................1907
Hubbard, Dr. Lucius L., Houghton, Mich.....................1907
Hubbard, Mrs. Sara A., 177 Woodruff Ave., Brooklyn, N. Y.......1891
Hunn, John T. Sharpless, 1218 Prospect Ave., Plainfield, N. J.....1895
Hunt, Chreswell J., 2337 S. Paulina St., Chicago, Ill.............1902
Hutchinson, Dr. W. F., Box 42, Portsmouth, Va..................1910
Ingalls, Charles E., East Templeton, Mass...................1885
Ingersoll, Albert M., Box 843, San Diego, Cal.................1885
Irving, John, 52 Broadway, Glen Cove, N. Y....................1894
Isham, C. B., 30 E. 63d St., New York City.......................1891
Ives, Roy C., R. R. No. 2, Clare, Iowa..........................1908
Jackson, Hartley, H. T., Biological Survey, Washington, D. C.....1910
Jackson, Thomas H., 304 N. Franklin St., West Chester, Pa.......1888
James, Mrs. I. M., 105 W. Court St., Doylestown, Pa.............1909
Jenney, Charles F., 100 Gordon Ave., Hyde Park, Mass..........1905
Jessup, J. M., Smithsonian Institution, Washington, D. C.........1910
Jewel, Lindsey L., Gatun, Canal Zone, Panama.................1910
Johns, Erwin Wm., Tempe, Arizona...........................1910
Jewett, Stanley G., 582 Bidwell Ave., Portland, Oregon.........1906
Jewett, McCormick, 205 Yale Station, New Haven, Conn........1909
Johnson, Mrs. Grace Pettis, City Library Association, Springfield,
Mass...1908
Johnson, Frank Edgar, 16 Amackassin Terrace, Yonkers, N. Y.....1888
Johnson, James Howard, Bradford, N. H......................1894
Johnson, Walter Adams, 18 Gramercy Park, New York City......1889
Johnson, William S., Lyons, N. Y............................1893
Jordan, A. H. B., Lowell, Wash.............................1888
Judd, Elmer T., Cando, N. D...............................1895
Jump, Mrs. Edwin R., 350 Waltham St., West Newton, Mass.......1910

Kalmbach, Edwin R., Biological Survey, Washington, D. C.......1910
Keays, James Edward, 328 St. George St., London, Ontario.........1899
Keim, Thomas Daniel, 405 Radcliffe St., Bristol, Pa...............1902
Kellogg, Charles D., North Newry, Maine..................1908
Kennard, Frederic Hedge, Dudley Road, Newton Centre, Mass...1892
Kent, Edwin C., 90 West St., New York City..................1907
Kermode, Francis, Curator Provincial Museum, Victoria B. C.....1904
Keyes, Prof. Chas. R., Mt. Vernon, Ia.......................1904
*Kidder, Nathaniel T., Milton, Mass........................1906
Kilgore, William, Jr., 1705 4th Ave., S., Minneapolis, Minn......1906
Kilman, A. H., Ridgeway, Ontario..........................1909
King, Le Roy, 20 E. 84th St., New York City..................1901
Kirkham, Mrs. James W., 275 Maple St., Springfield, Mass..........1904
Kirkham, Stanton D., Milford, Pinewood, S. C..................1910
Kirkwood, Frank C., Long Green, Md........................1892
Kittredge, Joseph, Jr., 67 Cypress St., Brookline, Mass..........1910
Kloseman, Miss Jessie E., 4 Spruce St., Dedham, Mass..........1909
Knaebel, Ernest, 3507 Morrison St., Chevy Chase, D. C.........1906
Knapp, Mrs. Henry A., 301 Quincy Ave., Scranton, Pa...........1957
Knolhoff, Ferdinand William, 298 Ridgewood Ave., Glen Ridge.1890
Kohler, Louis Slidell, 98 Watsessing Ave., Bloomfield, N. J.....1910
Kopman, Henry Hazlitt, 410 Pine St., New Orleans, La..........1899
Kremer, Roland Edward, 1720 Vilas St., Madison, Wis..........1909
Kuser, Anthony R., Bernardsville, N. J.......................1908
Kuser, John Dryden, Bernardsville, N. J......................1910
Kuser, Miss Susie Dryden, Bernardsville N. J..................1910
Kutchin, Dr. Victor, Green Lake, Wis........................1905
Lacey, Howard George, Kerrville, Texas......................1899
Lancashire, Mrs. James Henry, Alma, Mich...................1909
Lane, Lawton W., 121 Franklin St., Lynn, Mass.................1909
Lang, Herbert, Amer. Mus. Nat. Hist., New York City...........1907
Langmaid, Miss Bertha, 2 Gordon Terrace, Brookline, Mass.......1908
Lantz, Prof. David Ernest, Dept. of Agriculture, Washington, D. C.1885
Larrabee, Austin P., 548 Mathewson Ave., Wichita, Kan.........1902
Latimer, Miss Caroline P., 19 Pierrepont St., Brooklyn, N. Y.....1898
Laurent, Philip, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa...1902
Law, J. Eugene, Hollywood, Cal.............................1907
Lawrence, John B., 126 E. 30th St., New York City..............1907
Levey, W. Charlesworth, 53 Waverly St., Brookline, Mass.......1908
Lewis, Dr. Frederic T., Harvard Medical School, Boston, Mass.....1909
Lincoln, Frederick Charles, 3350 Shoshone St., Denver, Colo.....1910
Linton, Clarence B., 125 West Ocean Ave., Long Beach, Cal......1908
Loomis, John A., Mereta, Texas.............................1887
Lord, Rev. William R., Dover, Mass..........................1901
Loring, J. Alden, Owego, N. Y..............................1889
Low, Ethelbert T., 30 Broad St., New York City................1907

Lum, Edward H., Chatham, N. J. 1904
Lurvey, Samuel A., Box 161, South West Harbor, Maine 1908
Luther, Clarence H., 8 McIlley Bldg., Fayetteville, Ark. 1910
MacDougall, George R., 112 Wall St., New York City 1890
Mackie, Wm. C., 54 Coolidge St., Brookline, Mass. 1908
Maclay, Mark W., Jr., 70 West 55th St., New York City 1905
Maddock, Miss Emeline, The Belgravia, Philadelphia, Pa. 1897
Maher, J. E., Windsor Locks, Conn. 1902
Maitland, Robert L., 141 Broadway, New York City 1889
Marble, Richard M., 7 Keiffer St., Brookline, Mass 1907
March, Prof. John Lewis, Union College, Schenectady, N. Y. 1903
Marrs, Mrs. Kingsmill, Saxonville, Mass. 1903
Marsden, H. W., Witch Creek, Cal. 1904
Martin, Miss Maria Ross, Box 365, New Brunswick, N. J. 1902
Marx, Edward J. F., 8 Chestnut Terrace, Easton, Pa. 1907
Mathews, F. Schuyler, 17 Frost St., Cambridge, Mass. 1908
Maule, Geo. C., Gum Tree, Pa. 1910
McClintock, Norman, 504 Amberson Ave., Pittsburgh, Pa. 1900
McConnell, Harry B., 142 E. Warren St., Cadiz, O 1904
McCook, Philip James, 15 William St., New York City 1895
McFarland, A. C., 1205 E. 60th St., Chicago, Ill. 1909
McHatton, Dr. Henry, Macon, Ga. 1898
McIlhenny, Edward Avery, Avery Island, La. 1894
McIntire, Mrs. Herbert Bruce, 4 Garden St., Cambridge, Mass. . . 1908
McKechnie, Frederick Bridgham, Ponkapog, Mass. 1900
McLain, Robert Baird, Market and 12th Sts., Wheeling, W. Va. . . . 1893
McMillan, Mrs. Gilbert, 1 Mercer Circle, Cambridge, Mass. 1902
Mead, Mrs. E. M., 2465 Broadway, New York City 1904
Merriam, Charles, Weston, Mass. 1908
Merriam, Henry F., 94 New England Ave., Summit, N. J. 1905
Merrill, Harry, Bangor, Maine 1883
Mershon, W. B., Saginaw, Mich. 1905
Metcalf, Willard L., 33 West 67th St., New York City 1908
Miller, Chas. W., Shawnee-on-Delaware, Pa. 1909
Miller, James Henry, Lowville, N. Y. 1904
Mills, Harry C., Box 218, Unionville, Conn. 1897
Mills, Prof. William C., Ohio State Univ., Columbus, O 1900
Mitchell, Dr. Walton I., 603 Beacon Bldg., Wichita, Kan. 1893
Moore, Miss Eliz. Putnam, 70 West 11th St., New York City 1905
Moore, Robert Thomas, 46 Mansion Ave., Haddonfield, N. J. 1898
Moore, William G., 257 W. Main St., Haddonfield, N. J. 1910
Morcom, G. Frean, 1815 N. Raymond Ave., Pasadena, Cal. 1886
Morgan, Albert, Box 1323, Hartford, Conn. 1903
Morse, Miss Margaret, Clark University, Worcester, Mass. 1907
Mosher, Franklin H., 17 Highland Ave., Melrose, Mass. 1905
Murphey, Dr. Eugene E., 444 Tellfair St., Augusta, Ga. 1903

Murphy, Robert C., Brown Univ., Providence, R. I..............1905
Musgrave, John K., 3516 Shady Ave., Allegheny, Pa..............1909
Musselman, Thomas Edgar, Gem City Business College, Quincy, Ill.1910
Myers, Mrs. Harriet W., 306 Ave. 66, Los Angeles, Cal...........1906
Myers, Miss Lucy F., Brookside, Poughkeepsie, N. Y.............1898
Nash, Herman W., Box 264, Pueblo, Colo......................1892
Nelson, Emory E., 531 Grain Exchange, Winnipeg, Manitoba.....1908
Nelson, James Allen, Bureau of Entomology, Washington, D. C...1898
Newhall, Daniel S., Strafford, Pa.............................1908
Newman, Rev. Stephen M., Hagerstown, Md....................1898
Nichols, John M., 46 Spruce St., Portland, Me.................1890
Nichols, John Treadwell, Am. Mus. Nat. Hist., New York City..1901
Nolte, Rev. Felix, St. Benedict's College, Atchison, Kan..........1903
Norris, J. Parker, Jr., care of Evening Bulletin, Philadelphia, Pa...1904
Norris, Roy C., 725 N. 10th St., Richmond, Ind.................1904
Novy, Frank Oriel, 721 Forest Ave., Ann Arbor, Mich............1909
Nowell, John Rowland, Box 979, Schenectady, N. Y.............1897
O'Connor, Haldeman, 25 N. Front St., Harrisburg, Pa............1896
Ogden, Dr. Henry Vining, 141 Wisconsin St., Milwaukee, Wis.....1897
Oldys, Henry, Dept. of Agriculture, Washington, D. C............1896
*Oliver, Dr. Henry Kemble, 2 Newbury St., Boston, Mass........1900
Osburn, Pingree S., 189 E. Colorado St., Pasadena, Cal..........1910
Overton, Dr. Frank, Patchogue, N. Y.........................1909
Owen, Miss Juliette Amelia, 306 N. 9th St., St. Joseph, Mo.......1897
Packer, Jesse E., 444 S. 4th St., Darby, Pa.....................1910
Paine, Augustus G., Jr., 18 West 49th St., New York City.........1886
Parker, Mrs. Benjamin W., 4 Hopestill St., Dorchester Centre, Mass.1909
Parker, Hon. Herbert, South Lancaster, Mass...................1904
Parsons, William, Box 422, Manila, P. I........................1909
Paul, Lucius H., 59 West Miller St., Newark, New York..........1908
Peabody, Rev. P. B., Blue Rapids, Kan.........................1903
Pearse, Theed, Ivy, Va.......................................1907
Pearson, Leonard S., 132 Beechtree Lane, Wayne, Pa............1907
Peavey, Robert W., 791 Coney Island Ave., Brooklyn, N. Y.......1903
Peck, Morton E., 292 N. Summer St., Salem, Ore 1909
Peck, Walter M., 15 9th St., East Providence, R. I...............1909
Pennington, Fred Albert, 515 Chamber of Commerce, Chicago, Ill.1910
Perry, Dr. Elton, 610 Baylor St., Austin, Tex...................1902
Perry, Henry Joseph, 636 Beacon St., Boston, Mass.............1909
Peters, Albert S., State Bank, Lake Wilson, Minn...............1908
Peters, James Lee, Walnut Ave., Jamaica Plain, Mass............1904
Phelps, Mrs. J. W., Box 36, Northfield, Mass...................1899
Phelps, Mrs. Marian von R., 205 W. 57th St., New York City....1910
Philipp, Philip B., 220 Broadway, New York City...............1907
Phillips, Alexander H., 54 Hodge Road, Princeton, N. J.........1891
Phillips, John Charles, Wenham, Mass.......................1904

Pilsbury, Frank O., Box 592, Walpole, Mass....................1909
Pinchot, Gifford, Washington, D. C...........................1910
Pitcairn, William G., 3330 Perrysville Ave., Allegheny, Pa.........1906
Poe, Miss Margaretta, 1222 N. Charles St., Baltimore, Md.......1899
Pomeroy, Harry Kirkland, Box 575, Kalamazoo, Mich..........1894
Pond, Miss Ella J., 160 Lexington Ave., New York City..........1909
Poole, Alfred D., 401 W. 7th St., Wilmington, Del...............1901
Pope, Alexander, 1013 Beacon St., Brookline, Mass.............1908
Porter, Louis H., Stamford, Conn 1893
Praeger, William E., 421 Douglas Ave., Kalamazoo, Mich.......1892
Price, Arthur E., Grant Park, Ill.............................1908
Price, John Henry, Crown W Ranch, Knowlton, Mont...........1906
Purdy, James B., R. F. D. 4, Plymouth, Mich...................1893
Raborg, Wm. A., Jr., Miurkirk, Md.............................1909
Raymond, Mrs. C. E., 21 3d St., Hinesdale, Ill...................1910
Rankin, Chas. S. G., St. George's, Bermuda....................1909
Raven, Henry C., Bay Shore, N. Y.............................1908
Rawle, Francis W., Lock Box 51, Bryn Mawr, Pa................1907
Rawson, Calvin Luther, R. F. D. 2, Putnam, Conn..............1885
Read, Albert M., 1140 15th St. N. W., Washington, D. C..........1895
Reagh, Dr. Arthur Lincoln, 39 Maple St., West Roxbury, Mass...1896
Redfield, Alfred C., 56 Plympton St., Cambridge, Mass........1907
Redfield, Miss Elisa Whitney, 29 Everett St., Cambridge, Mass..1897
Redington, Alfred Poett, Box 66, Santa Barbara, Cal..........1890
Reed, Chester A., 238 Main St., Worcester, Mass................1904
Reed, Miss Emily E., 12 Louisburg Sq., Boston, Mass.............1904
Reed, Hugh Daniel, 108 Brandon Place, Ithaca, N. Y............1900
Reed, Mrs. William Howell, Belmont, Mass....................1904
Rehn, James A. G., Acad. Nat. Sciences, Philadelphia, Pa..........1901
Reinbold, John C., 576 Main St., Hackensack, N. J..............1909
Rhoads, Charles J., Bryn Mawr, Pa..........................1895
Rice, James Henry, Jr., Summerville, S. C......................1910
Richards, Miss Harriet E., 36 Longwood Ave., Brookline, Mass...1900
Richardson, C. H., Jr., Stanford University, Cal................1903
Ridgway, John L., Chevy Chase, Md.........................1890
Riker, Clarence B., Maplewood, N. J..........................1885
Robbins, Miss Almeda B., Y. M. Library Association, Ware, Mass..1910
Roberts, John T., Jr., 350 Main St., Buffalo, N. Y..............1906
Roberts, William Ely, 1920 Spring Garden St., Philadelphia, Pa...1902
Robinson, Anthony W., 409 Chestnut St., Philadelphia, Pa.......1903
Robinson, Lewis W., Cresskill, N. J..........................1910
Robinson, Dr. Philip E., 102 Huntington Ave., Boston, Mass.....1908
Roe, Charles M., 252 Home Ave., Oak Park, Ill................1906
*Rogers, Charles H., 5 W. 82d St., New York City..............1904
Rolfe, Alfred G., care of High School, Pottstown, Pa...........1909
Rolfe, Mrs. Percival B., 98 State St., Portland, Me.............1909

Roosevelt, Franklin Delano, Hyde Park, N. Y...............1896
Ross, George H., 23 West St., Rutland, Vt......................1904
Rossignol, Gilbert R., Jr., 2116 Bull St., Savannah, Ga..........1909
Rowley, John, 42 Plaza Drive, Berkeley, Cal.....................1889
Sackett, Clarence, Rye, N. Y....................................1910
Sage, Henry M., Menands Road, Albany, N. Y.................1885
Salley, Fitzhugh, Charleston Museum, Charleston, S. C..........1907
Saltonstall, John Lee, Beverly. Mass.......................1909
Sanford, Harrison, 65 W. 50th St., New York City.............1905
Santens, Joseph A., Carnegie Museum, Pittsburgh, Pa...........1907
Sass, Herbert Ravenel, 23 Legare St., Charleston, S. C.........1906
Saunders, Aretas A., care of Forest Service, Anaconda, Mont......1907
Sauvola, Augustus E., Chassell, Mich...........................1909
Savage, James, 1097 Ellicott Sq., Buffalo, N. Y.................1895
Savage, Walter Giles, Delight, Ark..........................1898
Schantz, Orpheus M., 5215 W. 24th St., Cicero, Ill................1907
Schmidt, Waldo, 211 Florida Ave., N. W., Washington, D. C.......1910
Schmucker, Dr. S. C., Rosedale Ave., West Chester, Pa............1903
Scott, Henry R., 6 Charles River Sq., Boston, Mass.............1909
Seiss, Covington Few, 1338 Spring Garden St., Philadelphia, Pa.....1898
Shannon, Wm. Purdy, 1170 Broadway, New York City..........1908
Sharples, Robert P., West Chester, Pa......................1907
Shaw, William T., 600 Linden Ave., Pullman, Wash..............1908
Shearer, Amon R., Mont Belvieu, Tex........................1905
*Sherman, Miss Althea R., National, Iowa...................1907
Shiras, George, 3d, Stoneleigh Court, Washington, D. C..........1907
Shoemaker, Clarence R., 3116 P St., Washington, D. C.........1910
Shoemaker, Frank H., 206 Nebraska Hall, Station A, Lincoln, Neb..1895
Shore, Edwin W., 191 Campbell St., New Bedford, Mass.........1909
Shrosbree, George, Public Museum, Milwaukee, Wis............1899
Shumway, George, Galesburg, Ill 1906
Silliman, Harper, 4 Gramercy Park, New York City.............1902
Simmons, Geo. F., 701 Holman Ave., Houston, Texas.............1910
Sinclair, John Abbott, New Hampton, N. H.. 1909
Smith, Byron L., 2140 Prairie Ave., Chicago, Ill.................1906
Smith, Miss Ethel M., 318 Strong Ave., Stevens Point, Wis.... 1910
Smith, Rev. Francis Curtis, Boonville, N. Y..................1903
Smith, Prof. Frank, Univ. of Ill., Urbana, Ill....................1909
Smith, Horace G., Historical and Nat. Hist. Society, Denver, Colo.1888
Smith, Dr. Hugh M., 1209 M St. N. W., Washington, D. C.........1886
Smith, Jesse L., 141 South 2nd St., Highland Park, Ill.............1907
Smith, Louis Irvin, Jr., 3809 Chestnut St., Philadelphia, Pa........1901
Smith, Myrton T., 308 Pearl St., Hartford, Conn.................1909
Smith, Philo W., Jr., Box 285, Eureka Springs, Ark...............1903
Smith, Mrs. Ruth Cook, Woodcliffe Lake, N. J..................1909
Smith, Wilbur F., 198 Ely Ave., South Norwalk, Conn...........1909

Smyth, Prof. Ellison A., Jr., Polytechnic Inst., Blacksburg, Va....1892
Snyder, Will Edwin, R. F. D. 6, Beaver Dam, Wis...............1895
Soule, Mrs. Etta Rich, 11 Centre St., Watertown, Mass.........1909
Spaulding, Fred B., Lancaster, N. H.........................1894
Stanton, Prof. J. Y., 410 Main St., Lewiston, Me...............1883
Stanwood, Miss Cordelia Johnson, Ellsworth, Me...............1909
Stebbins, Miss Fannie A., 480 Union St., Springfield, Mass.......1903
Steele, John H., Flemington, N. J.............................1906
Stephens, T. C., Morningside College, Sioux City, Iowa...........1909
Stevens, Caroline M., 52 Bowdoin St., Portland, Me............1906
Stevens, Dr. J. F., Box 546, Lincoln, Neb.......................1908
Stiles, Edgar C., 345 Main St., West Haven, Conn..............1907
Stone, Clarence F., Branchport, N. Y.........................1903
Stone, Nathan F., Shrewsbury, Mass............................1908
Strater, Mrs. Wm. E., 1114 3d St., Louisville, Ky...............1910
Stratton-Porter, Mrs. Gene, Limberlost Cabin, Geneva, Ind.....1906
Strecker, John Kern, Jr., Baylor Univ., Waco, Texas............1909
Street, J. Fletcher, Beverly, N. J.............................1908
Sturgis, S. Warren, Groton, Mass.............................1910
Stuart, Miss Katharine H., 719 King St., Alexandria, Va.........1910
Sturtevant, Edward, St. George's School, Newport, R. I.........1896
Styer, Mrs. Katharine R., Concordville, Pa....................1903
Sumner, Mrs. Graham, Englewood, N. J.........................1910
Surface, Prof. Harvey Adam, State Zoölogist, Harrisburg, Pa......1897
Swain, John Merton, Box 142, Farmington, Me..................1899
Sweet, Edmund H., Sturgis, S. D............................. 1910
Swenk, Myron H., 3028 Starr Street, Lincoln, Neb................1904
Swezey, George, 855 S. 15th St., Newark, N. J..................1901
Taft, Miss Grace Ellis, 50 W. 93d St., New York City...........1910
Taylor, Alexander R., 1410 Washington St., Columbia, S. C......1907
Taylor, Thorne C., Hubbard Woods, Ill........................1908
Terrill, Lewis McI., 352 Elm Ave., Westmount, Quebec.........1907
Test, Charles Darwin, Golden, Col............................1906
Test, Dr. Frederick Cleveland, 4620 Greenwood Ave., Chicago, Ill..1892
Test, Louis Agassiz, Rolla, Mo...............................1908
Thomas, Miss Emily Hinds, 2000 Spruce St., Philadelphia, Pa......1901
Thompson, Chas. S., Box 207, Burbank, Cal.....................1909
Thompson, Roy, University, N. D.............................1905
Thorne, Samuel, 914 5th Ave., New York City..................1908
Tilley, Geo. D., Darien, Conn................................1910
Tinker, Almerin D., 631 S. 12th St., Ann Arbor, Mich...........1907
Toppan, George L., 672 Graceland Ave., Chicago, Ill..............1886
Tower, Mrs. Kate Denig, Hotel Bristol, Boston, Mass............1908
Townsend, Wilmot, 272 75th St., Brooklyn, N. Y................1894
Treganza, A. O., 610 Utah Saving's & Trust Bldg., Salt Lake City, Utah...1906

Trippe, Thomas M., Howardsville, Colo..........................1909
Trotter, William Henry, 36 N. Front St., Philadelphia, Pa.......1899
Trumbull, J. H., Plainville, Conn...............................1907
Tubbs, Prof. Frank Dean, 129 Wood St., Lewiston, Me............1909
Tudbury, Warren C., 33 Main St., Attica, N. Y...................1903
Tufts, Le Roy Melville, Thrushwood, Farmington, Me..........1903
Tufts, Miss Mary I., 163 Lewis St., Lynn, Mass..................1910
Tuttle, Dr. Albert H., 1069 Boylston St., Boston, Mass..........1908
Tuttle, Dr. Carl, Berlin Heights, Ohio..........................1890
Tuttle, Henry Emerson, 242 York St., New Haven, Conn........1909
Tweedy, Edgar, 13 Fairview Ave., Danbury, Conn...............1902
Ulrich, Albert George, 3307 Washington Ave., St. Louis, Mo.....1909
Underwood, William Lyman, Mass. Inst. Technology, Boston, Mass...1900
Upham, Mrs. William H., 212 3rd Ave., Marshfield, Wis...........1907
Valentine, Miss Anna J., Bellefonte, Pa.........................1905
Valentine, Miss Lucy W., 2 Trowbridge Terrace, Cambridge, Mass.1908
Van Beuren, Miss Louise, 21 W. 14th St., New York City........1909
Van Cortlandt, Miss Anne S., Croton-on-Hudson, N. Y..........1885
Van Name, Willard Gibbs, N. Y. State Museum, Albany, N. Y....1900
Van Sant, Miss Elizabeth, 2960 Dewey Ave., Omaha, Neb........1896
Vantassell, F. L., 116 High St., Passaic, N. J..................1907
Varick, Mrs. William Remsen, 1015 Chestnut St., Manchester, N. H.1900
Vetter, Dr. Charles, 50 Central Park West, New York City......1898
Visher, Stephen S., Vermilion, S. D.............................1904
Von Lengerke, Justus, 200 Fifth Ave., New York City...........1907
Von Rossem, Adrian, 223 N. Orange Grove, Pasadena, Cal........1908
Vrooman, Isaac H., Jr., 282 Hamilton St., Albany, N. Y..........1908
Wadsworth, Clarence S., 37 Washington St., Middletown, Conn...1906
Wales, Edward H., Hyde Park, N. Y...............................1896
Wales, Miss Ella, 186 Columbia Road, Dorchester, Mass.........1908
Walker, Curtis H., University of Chicago, Chicago, Ill............1910
Walker, Geo. R., R. F. D. 3, Murray, Utah.......................1909
Walker, Dr. R. L., 355 Main Ave., Carnegie, Pa..................1888
Wallace, Dr. A. H., 204 Bellevue Ave., Upper Montclair, N. J......1907
Wallace, James S., 69 Front St., Toronto, Ontario...............1907
Walter, Herbert E., Dr., 53 Arlington Ave., Providence, R. I.....1901
Walters, Frank, South Sandisfield, Mass.........................1902
Ward, Frank Hawley, 12 Grove Place, Rochester, N. Y...........1908
Ward, Henry L., 882 Hackett Ave., Milwaukee, Wis..............1906
Ward, Mrs. Martha E., 25 Arlington St., Lynn, Mass..............1909
Warner, Edward P., Concord, Mass..............................1910
Warner, Goodwin, 920 Center St., Jamaica Plain, Mass...........1908
Weber, J. A., Box 216, Palisades Park, N. J......................1907
Weir, J. Alden, 471 Park Ave., New York City....................1899
Wellman, Gordon B., 54 Beltran St., Malden, Mass..............1908

Wells, Frank S., 916 Grant Ave., Plainfield, N. J. 1902
Wentworth, Irving H., San Carlos, Tamaulipas, Mexico..........1900
Wetmore, Alexander, care of Museum, Lawrence, Kansas.......1908
Wetmore, Mrs. Edmund, 343 Lexington Ave., New York City.....1902
Weygandt, Cornelius, Wissahickon Ave., Mt. Airy, Philadelphia, Pa. 1907
Wharton, William P., Groton, Mass...........................1907
Wheeler, Edmund Jacob, 177 Pequot Ave., New London, Conn....1898
Wheeler, John B., East Templeton, Mass.......................1897
Wheelock, Mrs. Irene G., 1040 Hinman Ave., Evanston, Ill.......1902
White, Francis Beach, St. Paul's School, Concord, N. H..........1891
White, George R., Dead Letter Office, Ottawa, Ontario...........1903
White, W. A., 158 Columbia Heights, Brooklyn, N. Y.............1902
Whitehead, Ely L., 712 Michigan Ave., Evanston, Ill.............1908
Wickersham, Cornelius W., 43 Exchange Place, New York City..1902
Wikel, Henry H., Manual Training High School, Brooklyn, N. Y...1909
Wilbur, Addison P., 60 Gibson St., Canandaigua, N. Y............1895
Wilcox, Miss Alice W., 165 Prospect St., Providence, R. I.........1908
Wilcox, Dr. Emma D., 307 W. 98th St., New York City...........1905
Wilcox, T. Ferdinand, 115 W. 75th St., New York City..........1895
Wilde, Mark L. C., 311 N. 5th St., Camden, N. J..................1893
Willard, Bertel G., Box 107, Millis, Mass.....................1906
Willard, Frank C., Tombstone, Arizona........................1909
Willett, Victor John Austin, Wydecombe, Whiteman's Creek, B. C. 1909
Williams, Harry C., 5344 Cabanne Ave., St. Louis, Mo...........1908
Williams, Robert S., New York Botanical Gardens, Bronx Park,
New York City.......................................1888
Williams, Robert W., Jr., U. S. Dept. Agriculture, office of the
Solicitor, Washington, D. C................................1900
Williamson, E. B., Bluffton, Ind...............................1900
Wilson, Sidney S., German American Bank Bldg., St. Joseph, Mo...1895
Windle, Francis, 253 Dean St., West Chester, Pa................1909
Wise, Miss Helen D., 1514 13th St., N. W., Washington, D. C......1910
Wister, William Rotch, 505 Chestnut St., Philadelphia, Pa.......1904
Witherbee, Mrs. F. B., 106 Berkeley St., West Newton, Mass......1906
Wood, Mrs. Geo., 1313 Spruce St., Philadelphia, Pa...............1910
Wood, J. Claire, 179 17th St., Detroit, Mich....................1902
Wood, Nelson R., Smithsonian Institution, Washington, D. C.....1895
Wood, Norman A., University of Michigan, Ann Arbor, Mich......1904
Woodcock, Arthur Roy, Corvallis, Ore........................1901
Woodruff, Frank M., 225 Wisconsin St., Chicago, Ill.............1904
Woodruff, Lewis B., 24 Broad St., New York City...............1886
Worcester, Mrs. Alfred, Bacon St., Waltham, Mass.............1908
Worthington, Willis W., Shelter Island Heights, N. Y...........1889
Wright, Albert H., 115 Stewart Ave., Ithaca, N. Y...............1906
Wright, Miss Harriet H., 1637 Gratiot Ave., Saginaw, W. S., Mich.1907
Wright, Horace Winslow, 107 Pinckney St., Boston, Mass.......1902

Wright, Howard W., 830 N. Orange Grove Ave., Pasadena, Cal.	1907
Wright, Samuel, Conshohocken, Pa.	1895
Wyman, Luther E., R. R. No. 3, Nampa, Idaho	1907
Young, John A., Calder Villa, Bridge of Allan, Scotland	1907
Zappey, Walter R., 25 Rindgefield St., North Cambridge, Mass.	1905
Zimmer, J. T., 42d and Holdridge Sts., Lincoln, Neb.	1908

DECEASED MEMBERS.

Fellows.

	Date of Death
Aldrich, Charles	March 8, 1908
Baird, Spencer Fullerton	Aug. 19, 1887
Bendire Charles Emil	Feb. 4, 1897
Coues, Elliott	Dec. 25, 1899
Goss, Nathaniel Stickney	March 10, 1891
Holder, Joseph Bassett	Feb. 28, 1888
Jeffries, John Amory	March 26, 1892
McIlwraith, Thomas	Jan. 31, 1903
Merrill, James Cushing	Oct. 27, 1902
Sennett, George Burritt	March 18, 1900
Trumbull, Gurdon	Dec. 28, 1903
Wheaton, John Maynard	Jan. 28, 1887

Honorary Members.

Blanford, William Thomas	June 23, 1905
Bocage, J. V. Barboza du	July, 1908
Burmeister, Hermann	May 1, 1892
Cabanis, Jean	Feb. 20, 1909
Gätke, Heinrich	Jan. 1, 1897
Giglioli, Henry Hillyer	Dec. 14, 1909
Gundlach, Juan	March 14, 1809
Gurney, John Henry	April 20, 1896
Hartlaub, Gustav	Nov. 20, 1900
Huxley, Thomas Henry	June 29, 1890
Kraus, Ferdinand	Sept. 15, 1895
Lawrence, George Newbold	Jan. 17, 1895
Milne-Edwards, Alphonse	April 21, 1900
Newton, Alfred	June 7, 1907
Parker, William Kitchen	July 3, 1890
Pelzeln, August von	Sept. 2, 1891
Salvin, Osbert	June 1, 1898
Saunders, Howard	Oct. 20, 1907

Schegel, Hermann	Jan. 17, 1884
Seebohm, Henry	Nov. 26, 1895
Sharpe, Richard Bowdler	Dec. 25, 1909
Taczanowski, Ladislas	Jan. 17, 1890

Corresponding Fellows.

Altum, C. A.	Jan. 1, 1900
Anderson, John	Aug. 16, 1900
Baldamus, Eduard	Oct. 30, 1893
Blakiston, Thomas Wright	Oct. 15, 1891
Blasius, Rudolph	Sept. 21, 1907
Bogdanow, Modest Nikolaevich	March 4, 1888
Bryant, Walter, E.	May 21, 1905
Buller, Walter Lawry	July 19, 1906
Cooper, James Graham	July 19, 1902
Cordeaux, John	Aug. 1, 1899
David, Armand	Nov. 10, 1900
Fatio, Victor	March 19, 1909
Haast, Julius von	Aug. 15, 1887
Hargitt, Edward	March 19, 1895
Holub, Emil	Feb. 21, 1902
Homeyer, Eugen Ferdinand von	May 31, 1889
Layard, Edgar Leopold	Jan. 1, 1900
Leverkühn, Paul	Dec. 5, 1905
Lyttleton, Thomas Lord Lilford	June 17, 1896
Marschall, August Friedrich	Oct. 11, 1887
Malmgren, Anders Johan	April 12, 1897
Middendorff, Alexander Theodore von	Jan. 28, 1894
Mosjisovics, Felix G. Hermann August	Aug. 27, 1897
Oustalet, Emile	Oct. 23, 1905
Philippi, R. A.	Aug. —, 1904
Prejevalski, Nicolas Michaelovich	Oct. 20, 1887
Prentiss, Daniel Webster	Nov. 19, 1899
Pryer, Harry James Stovin	Feb. 17, 1888
Radde, Gustav Ferdinand	—— 1903
Schrenck, Leopold von	Jan. 20, 1894
Séleys-Longschamps, Edmond de	Dec. 11, 1900
Severtznow, Nicolai Alekseewich	Feb. 8, 1885
Shelley, George Ernest	Nov. 29, 1910
Stevenson, Henry	Aug. 18, 1888
Tristram, H. B.	March 8, 1906
Wharton, Henry T.	Sept. —, 1895
Woodhouse, Samuel W.	Oct. 23, 1904

Members.

Fannin, John	June 20, 1904
Hardy, Manly	Dec. 9, 1910
Judd, Sylvester Dwight	Oct. 22, 1905
Ralph, William LeGrange	July 8, 1907
Whitman, Charles Otis	Dec. 6, 1910

Associates.

Adams, Charles F.	May 20, 1893
Allen, Charles Slover	Oct. 15, 1893
Antes, Frank T.	Feb. 6, 1907
Atkins, Harmon Albro	May 19, 1885
Avery, William Cushman	March 11, 1894
Bailey, Charles E.	——, 1905
Barlow, Chester	Nov. 6, 1902
Baur, George	June 25, 1898
Beckham, Charles Wickliffe	June 8, 1888
Bill, Charles	April —, 1897
Birtwell, Francis Joseph	June 29, 1901
Boardman, George Augustus	Jan. 11, 1901
Bolles, Frank	Jan. 10, 1894
Brackett, Foster H.	Jan. 5, 1900
Breese, William Lawrence	Dec. 7, 1889
Breninger, George Frank	Dec. 3, 1905
Brennan, Charles F.	Mar. 21, 1907
Brokaw, Louis W.	Sept. 3, 1897
Brown, John Clifford	Jan. 16, 1901
Browne, Francis Charles	Jan. 9, 1900
Brownson, W. H.	Sept. 6, 1909
Burnett, Leonard E.	March 16, 1904
Cairns, John S.	June 10, 1895
Call, Aubrey Brendon	Nov. 20, 1901
Campbell, Robert Argyll	April —, 1897
Canfield, J. B.	Feb. 18, 1904
Carleton, Cyrus	Nov. 15, 1907
Carter, Edwin	—— 1900
Carter, Isabel Paddock	Sept. 15, 1907
Chadbourne, Mrs. Arthur Patterson	Oct. 4, 1908
Clark, John Nathaniel	Jan. 13, 1903
Coe, W. W.	April 26, 1885
Colburn, William W.	Oct. 17, 1899
Collett, Alonso M.	Aug. 22, 1902

Conant, Mrs. Thos. O.	Dec. 28, 1907
Corning, Erastus, Jr.	April 9, 1893
Daffin, Wm. H.	April 21, 1902
Dakin, John Allen	Feb. 21, 1900
Davis, Walter R.	April 8, 1907
Dexter, Newton	July 27, 1901
Dodge, Julian Montgomery	Nov. 23, 1909
Elliott, Samuel Lowell	Feb. 11, 1889
Fairbanks, Franklin	April 24, 1895
Ferry, John Farwell	Feb. 11, 1910
Fisher Wm. Hubbell	Oct. 6, 1909
Fowler, Joshua Lounsbury	July 11, 1899
Fuller, Charles Anthony	Mar. 16, 1906
Gesner, Abraham Herbert	April 30, 1895
Goss, Benjamin Franklin	July 6, 1893
Hatch, Jesse Maurice	May 1, 1898
Hoadley, Frederick Hodges	Feb. 26, 1895
Holmes, LaRue Klingle	May 10, 1906
Hoopes, Josiah	Jan. 16, 1904
Howland, John Snowdon	Sept. 19, 1885
Ingersoll, Joseph Carleton	Oct. 2, 1898
Jenks, John Whipple Potter	Sept. 27, 1894
Jesurun, Mortimer	March —, 1905
Jouy, Pierre Louis	March 22, 1894
Kelker, Wm. A.	Feb. 15, 1908
Knight, Wilbur Clinton	July 8, 1903
Knox, John C.	July 9, 1904
Knox, John Cowing	June 1, 1904
Koch, August	Feb. 15, 1907
Kumlien, Ludwig	Dec. 4, 1902
Kumlien, Thure	Aug. 5, 1888
Lawrence, Robert Hoe	April 27, 1897
Lee, Leslie Alexander	May 20, 1908
Linden, Charles	Feb. 3, 1888
Lloyd, Andrew James	June 14, 1906
Mabbett, Gideon	Aug. 15, 1900
Maitland, Alexander	Oct. 25, 1907
Marble, Charles C.	Sept. 25, 1900
Marcy, Oliver	March 19, 1899
Maris, Willard Lorraine	Dec. 11, 1895
McEwen, Daniel C.	Nov. 1, 1909
McKinlay, James	Nov. 1, 1899
Mead, George Smith	June 19, 1901
Minot, Henry Davis	Nov. 13, 1890
Morrell, Clarence Henry	July 15, 1902
Nichols, Howard Gardner	June 23, 1896

Nims, Lee	March 12, 1903
Northrop, John I.	June 26, 1891
Paddock, Isabel M.	Sept. 15, 1907
Park, Austin F.	Sept. 22, 1893
Paulmier, Frederick Clark	March 3, 1906
Pomroy, Grace V.	May 14, 1906
Ragsdale, George Henry	March 25, 1895
Ready, George H.	March 20, 1903
Richardson, Jenness	June 24, 1893
Robins, Mrs. Edward	July 2, 1906
Sand, Isabella Low	April 20, 1906
Selous, Percy Sherborn	April 7, 1900
Slater, James H.	Feb. —, 1895
Slevin, Thomas Edwards	Dec. 23, 1902
Small, Edgar Albert	April 24, 1884
Smith, Clarence Albert	May 6, 1896
Snow, Francis Huntington	Sept. 20, 1908
Southwick, James Mortimer	June 3, 1904
Stowe, W. H.	March —, 1895
Sweiger, Mrs. J. L.	March 23, 1907
Taylor, Alex. O'Driscoll	April 10, 1910
Thompson, Millet T.	Aug. 7, 1907
Thorne, Platte Marvin	March 16, 1897
Thurber, Eugene Carleton	Sept. 6, 1896
Vennor, Henry George	June 8, 1884
Waters, Edward Stanley	Dec. 26, 1902
Willard, Samuel Wells	May 24, 1887
Wood, William	Aug. 9, 1885
Woodruff, Edward Seymour	Jan. 15, 1909
Worthen, Charles K.	May 27, 1909
Young, Curtis Clay	July 30, 1902

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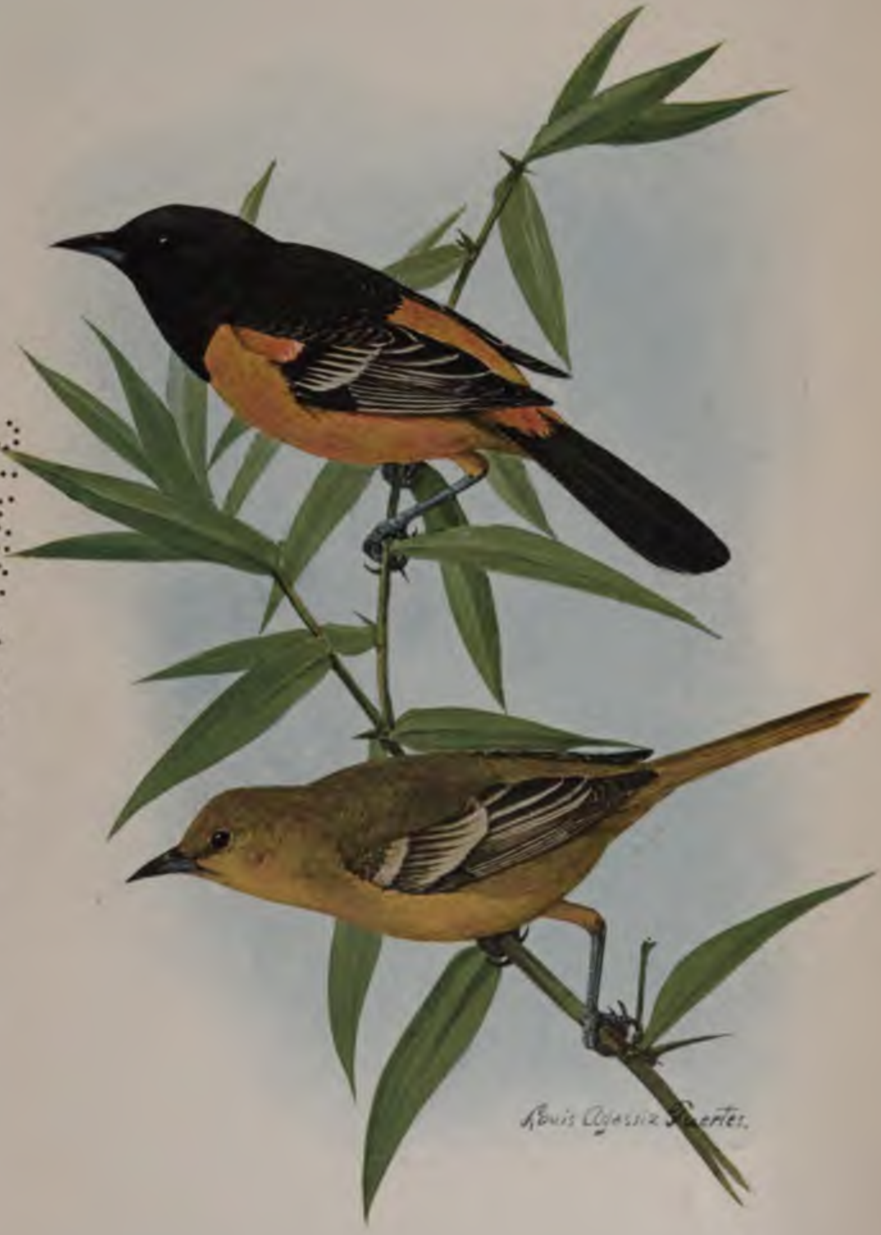
Louis Agassiz Fuertes.

ICTERUS FUERTESI CHAPMAN
ADULT MALE AND FEMALE
(Two-thirds natural size)

THE AUK:

A QUARTERLY JOURNAL OF

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DESCRIPTION OF A NEW ORIOLE (*ICTERUS FUERTESI*) FROM MEXICO.

BY FRANK M. CHAPMAN.

Plate I.

AMONG the birds collected by Louis Agassiz Fuertes and the writer in Mexico, between February 23 and April 21, 1910, are four specimens of an apparently undescribed oriole which, while most nearly related to *Icterus spurius*, appears to be specifically distinct from that bird. For this new bird I propose the name *Icterus fuertesi*, in honor of Louis Agassiz Fuertes, not alone in recognition of his invaluable services to ornithology, but also because, attracted by its notes, he was the actual discoverer of the species to which his name is now given.

This interesting species was found on the south bank of the Tamesi River, Mexico, some 75 miles by river and 35 miles in an air-line from Tampico, where from April 1–9, we were the guests of Mr. Thomas H. Silsbee on the sugar plantation Paso del Haba. The Tamesi River at this point is 100 yards wide. Its banks are high and, except where cleared, support narrow strips of heavy forest which, a short distance inland, is flanked by the lower, more scrubby growth characteristic of the region.

The orioles in question inhabited the dense bushy growth which has sprung up on the river banks from which the forest has been cut. They were all taken in a space not more than two hundred yards long and, in addition to the four specimens secured, at least one more adult male was seen.

Whether the birds also occurred in favorable areas beyond the heavy forest I am unable to say, since the surprising abundance of bird-life near the river claimed all our time and attention.

In the same bit of second growth from which the four specimens of *Icterus fuertesi* were taken I collected a perfectly typical adult male *Icterus spurius*, a circumstance which suggests the possibility of the two male specimens of the proposed new bird being aberrant examples of that species. Opposed to this theory, however, are the following facts: (1) The two adult males secured are essentially alike, the third, which was well seen, was of the same buffy color, while examination of very large series of adult *Icterus spurius* reveals no specimen approaching those representing the proposed new species. (2) The four specimens of *Icterus fuertesi* are all smaller than any specimens of *Icterus spurius* which I have examined, as the appended table of southern breeding birds shows, while the Tamesi specimen of *Icterus spurius* (as well as an adult male taken by Mr. Fuertes in the Tamiahua Lagoon, April 17, 1910) agrees in size with specimens of *Icterus spurius* from Texas. (3) The four specimens of *Icterus fuertesi* had the sexual organs much enlarged and were evidently about to breed, while in the specimens of *Icterus spurius* the sexual organs were but slightly increased in size. In short, it is believed that the specimen of *Icterus spurius*, taken with *Icterus fuertesi* on April 5, was a northbound migrant, a belief supported by observations made in the spring of 1891 at Corpus Christi, Texas, where *Icterus spurius* was first noted as arriving from the south on April 5.

It may be added that the song of *Icterus fuertesi*, while unmistakably of the Orchard Oriole type, differs materially from the song of that species. It is less rich and loud, and lacks a certain distinctness of articulation and finish which characterize the song of *Icterus spurius*.

The type of *Icterus affinis* Lawr. (Am. Mus. No. 41954) has the chestnut-colored areas of rather exceptional richness and depth. It was taken at Brownsville, Texas, by J. P. McCown, evidently in the spring, although the label lacks date. Its small size, however, would indicate that it was a breeding bird, and we have

Merrill's statement (Proc. U. S. Nat. Mus., 1878, p. 135) to the effect that this species nests "rather plentifully" at that point. In view of the fact that breeding specimens from southern Texas and from Mexico in the American Museum collection (see table beyond) while smaller, as might be expected, show no appreciable difference in color from specimens of *Icterus spurius* at the northern limit of its range, it is not a little surprising that within a distance of 250 miles, and with no very striking change in environment, a difference as great as that exhibited by *Icterus fuertesi* should be shown. While the new bird, therefore, appears unquestionably to be a representative of *Icterus spurius*, it probably does not intergrade with that form, and I have no hesitation in describing it as a distinct species.

Icterus fuertesi sp. nov.

FUERTES'S ORIOLE.

Chars. Sp.— Most nearly related to *Icterus spurius*, but smaller with the chestnut areas of that species replaced by a color which varies from buff to ochraceous. Type, Coll. Am. Mus. Nat. Hist., 95909; Paso del Haba, south shore of Tamesi River, 35 miles northwest of Tampico, Mexico, April 6, 1910; collected and presented by Louis Agassiz Fuertes.

Description of Adult Male (type).— Head, throat, center of chest, foreback and scapulars black, the two latter slightly edged with grayish brown; rest of body, including upper and under tail-coverts, rich buff with a slight yellowish cast, particularly medianly on the underparts (the color here is much like the buffy tips to the fall plumage of adult males of *Icterus spurius*), and with a cinnamon shade on the rump; wings black, edged externally with whitish, lesser, median, and under wing-coverts cinnamon-buff, greater wing-coverts black, bordered terminally with white; tail black, the outer feathers graduated and narrowly tipped with whitish. Wing, 71; tail, 64; exposed culmen, 15 mm.

Adult Female.— Similar in color to the corresponding plumage of *Icterus spurius* but size smaller. Wing, 68; tail, 63.5; exposed culmen, 14.5 mm. (No. 95908, Tamesi River, Mexico, April 7, 1910, F. M. C.)

Immature Male.— Similar in color to corresponding plumage of *Icterus spurius*, but smaller. Wing, 72; tail, 65.5; exposed culmen, 15 mm. (No. 95907, Tamesi River, April 7, 1910, F. M. C.)

TABLES OF MEASUREMENTS.

Icterus fuertesi.

Coll.	Sex.	Date and Place.	Wing.	Tail.	Ex. Culmen.
			mm.	mm.	mm.
Am. Mus. 95909 (type)	♂ ad.	Tamesi River, Mex. Apr. 6	71	64	15
L. A. F. 2201	♂ ad.	" " Apr. 6	72.5	66.5	16
Am. Mus. 95907	♂ im.	" " Apr. 7	72	65.5	15.
Am. Mus. 95908	♀ ad.	" " Apr. 7	68	63.5	14.5

Icterus spurius.

Coll.	Sex.	Date and Place.	Wing.	Tail.	Ex. Culmen.
			mm.	mm.	mm.
Am. Mus., aver. 5 ads.	♂ ad.	Vicinity New York City, May	81.5	74.5	16.5
" " 82901	♂ ad.	Hidalgo, Tex., May 24	78.	68.	—
" " 82885	♂ ad.	Rio Grande City, June 23	74.5	68.	16.
" " 82891	♂ ad.	Lomita, Tex., July 12	79.5	70.	16.5
" " 82890	♂ ad.	" " July 12	79.	70.	16.
" " 87944	♂ ad.	Escuinapa, Sinaloa, Mex. July 29	77.	68.	—
" " 87943	♂ ad.	Rosario, Sinaloa, Mex., July 22	77.	70.	15.
" " 95906	♂ ad.	Tamesi River, Mex., April 6	77.	71.	15.5
" " 75322	♀ ad.	Hastings, N. Y., May 15	75.	65.5	15.5
" " 82892	♀ ad.	Lomita, Tex., July 4	69.	64.5	15.

ANNOTATED LIST OF THE BIRDS OF HARDING COUNTY, NORTHWESTERN SOUTH DAKOTA.[1]

BY STEPHEN SARGENT VISHER.

The following list is based upon three sources of information: (1) Mr. G. B. Grinnell passed through the area from northeast to southwest during July 9–16, 1874, and through the western part August 17–20 with the Custer Expedition to the Black Hills. His report as naturalist, published in Ludlow's 'Report of Reconnaissance of the Black Hills,' contains some statements which certainly apply to our district. (2) Mr. Sal Catron of Camp Crook has lived there on the Little Missouri River since 1883. Continual hunting has made him familiar with the larger birds. (3) As naturalist to the South Dakota Geological and Natural History Survey, it was my privilege to spend practically two months (July 7–September 4) of the summer of 1910 in this area. Of the seventy-odd townships of the county, all but a half dozen of the least interesting were studied. Time did not suffice for the making of a comprehensive collection of the birds, but those of doubtful identity were, as far as practicable, as well as certain others, collected and preserved for the State museum.

Harding County is situated in the extreme northwestern corner of South Dakota. Its north boundary is North Dakota, and its western, Montana. It extends southward almost to the Montana-Wyoming corner. East by west the length is fifty-four miles; its width is fifty-one miles. The range in altitude is about seven hundred feet, from about 3,000 feet to about 3,700 feet. Physiographically the most of the area is a high divide between the Little Missouri River drainage and that east by the Moreau and Grand Rivers to the Missouri. This divide is studded with several groups of flat-topped elevations called buttes or hills which rise about 400 feet above their bases, often with sheer cliffs for most of the height. The forested ones, and hence those of especial interest, are: (1) North and South Cave Hills, which lie in the north central part of the county. The Cave Hills Forest Reserve covers over 23,000 acres. (2) Slim Buttes. This much dissected ridge extends for about twenty-five miles from almost the south line northward, and within a few miles of the eastern edge of the county. The Slim Buttes Reserve covers about 58,000 acres. (3) The East and West Short Pine Hills (Forest Reserve covers 23,000 acres) lie in the southwestern portion of the county. (4) The Long Pine Hills are west of the Little Missouri River and mostly in Montana, but differ from the Short Pines only in being larger and more heavily forested.

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[1] Published by the permission of the State Geologist.

The large streams of the area are: (1) The Little Missouri River which flows northward into North Dakota almost across the county and near its western border. It is ordinarily but a small, shallow and swift stream. (2) The North Fork of the Grand River, along the north edge of the area. The South Fork drains most of the county. It flows eastward from near the center of the region. (3) The North Fork of the Moreau River flows east from the Short Pine Hills. The only other flowing streams are one or two short brooks in each of the forested buttes. The larger creeks have permanent water holes. After heavy rains, pools, usually but a few inches deep, are formed in blow-outs on the plains. The year 1910, until August 15, was unusually dry.

The vegetal covering of most of the area is that of a steppe, low 'buffalo' grasses and scattered perennials and annuals. On the 'tables' of the buttes and along the flood plains of the streams a ranker growth of grass is found. Along the streams are groves or individual trees of cottonwood, box-elder, willow or ash, or thickets of buffalo-berry, etc. The largest groves are in the Little Missouri Valley near Camp Crook, which is in the central western part of the county. Trees are almost lacking along the Grand and Moreau Rivers. The cañons of the higher buttes are more or less filled with groves of the deciduous trees mentioned above and thickets of plum, hawthorn, choke-cherry, etc. The slopes of the high buttes are largely covered with western yellow pine (*Pinus ponderosa scopulorum*). The terraces of the streams, especially in the western part of the county, are covered with sage-brush. The local badlands present thickets of cedar and patches of juniper as well as sage-brush and grease-wood.

The southern half of the county is over sixty miles from a railroad.

Ecologically the nesting birds may be grouped into five or more distinct associations; those of the steppe of the deciduous woods along the streams, of the pine forests, of badlands, and those of bodies of water.

1. The conspicuous nesting birds of the steppe or plains are Upland Plover, Long-billed Curlew, Marsh, Swainson and Sparrow Hawks, Burrowing Owl, Western Nighthawk, Desert Horned Lark, Western Meadowlark, Brewer's Blackbird, Chestnut-collared and McCown's Longspurs, Western Vesper Sparrow, Lark Bunting and Sprague's Pipit.

2. The most numerous birds of the groves of deciduous trees are: Mourning Dove, Downy and Red-headed Woodpeckers, Northern and Red-shafted Flickers, Kingbird, Traill's Flycatcher, Magpie, Crossbill, Goldfinch, Western Lark Sparrow, Arctic Towhee, Black-headed Grosbeak, White-rumped Shrike, Yellow Warbler, Long-tailed Chat, Brown Thrasher, and Robin.

3. In the pine woods are to be found Hairy Woodpecker, Clarke's Nutcracker, Piñon Jay, White-winged Junco, Arctic Towhee, Cedar Waxwing, Audubon's Warbler, Ovenbird, Western House Wren, Red-bellied Nuthatch, Long-tailed Chickadee and Western Bluebird.

4. In badlands, Prairie Falcon, Western Horned Owl, Say's Phœbe, Cliff Swallow and Rock Wren are almost certain to breed.

5. About water, the following were frequently found in midsummer: Blue and Green-winged Teals, Shoveller, Pintail, Spotted and Solitary Sandpipers, Killdeer, Kingfisher, Brewer's Blackbird.

Harding County presents more variety than surrounding counties do, and it is probable that a complete list of its birds would include practically all of those of the southwestern fourth of North Dakota, southeastern Montana, and even northeastern Wyoming.

List of Species

1. **Colymbus nigricollis californicus.** EARED GREBE.— An occasional migrant along the Little Missouri River.

2. **Podilymbus podiceps.** PIED-BILLED GREBE.— Reported by Catron and others to be a fairly abundant migrant along the larger streams.

3. **Gavia immer.** LOON.— Mr. Catron has shot a loon on two occasions, flying along the Little Missouri.

4. **Larus delawarensis.** RING-BILLED GULL.— Taken by Grinnell on the Little Missouri River in July.

5. **Sterna forsteri.** FORSTER'S TERN.*[1] — A flock of terns, probably of this species, was seen hovering over the Little Missouri River August 30.

6. **Hydrochelidon nigra surinamensis.** BLACK TERN.— A fairly common migrant through the county.

7. **Mergus americanus.** AMERICAN MERGANSER.— Taken, infrequently, by Catron.

8. **Merganser serrator.** RED-BREASTED MERGANSER.* — Mr. Catron reports having several times shot them on the Little Missouri River near Camp Crook during migrations. Taken by Grinnell near our area.

9. **Lophodytes cucullatus.** HOODED MERGANSER.— Occasional migrant (Catron). Grinnell found them nesting near our area.

10. **Anas platyrhynchos.** MALLARD.— Abundant migrant, arriving August 22. Reported by Grinnell, Catron, and others to nest during wet summers.

11. **Mareca americana.** BALD-PATE.— A common migrant (Catron). Grinnell reports that in 1874 they bred near our area.

12. **Nettion carolinensis.** GREEN-WINGED TEAL.— Breeds wherever possible. Six broods seen, one on an artificial pond not larger than two rods square.

13. **Querquedula discors.** BLUE-WINGED TEAL.— As abundant as the preceding.

14. **Spatula clypeata.** SHOVELLER.— Common migrant. One brood of young seen on an artificial pond.

15. **Dafila acuta.** PINTAIL.— Abundant breeder on artificial ponds and along Grand River.

16. **Marila americana.** RED-HEAD.* — Usually fairly abundant during migrations (Catron).

17. **Marila vallisineria.** CANVAS-BACK.— Uncommon, during migrations (Catron).

18. **Marila marila.** GREATER SCAUP DUCK.* — Abundant migrant along the rivers (Catron).

19. **Marila affinis.** LESSER SCAUP DUCK.— Very common migrant (Catron).

20. **Charitonetta albeola.** BUFFLE-HEAD.— Abundant migrant.

21. **Chen hyperborea** (subsp.). SNOW GOOSE.— Not commonly seen, most frequently in spring (Catron and others).

22. **Anser albifrons gambeli.** WHITE-FRONTED GOOSE.* — Catron reports this to be the most abundant goose; a common migrant.

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[1] An asterisk indicates that the species is not mentioned in the author's list of birds of Western South Dakota, published in 'The Auk,' April, 1909, pp. 144–153.

23. **Branta canadensis.** CANADA GOOSE.— Grinnell found this species breeding abundantly along the Little Missouri and other streams in 1874. Catron reports they were fairly common till 1890. Now infrequent and seen only as a migrant.

24. **Branta hutchinsi.** HUTCHINS'S GOOSE.— Not common during migrations (Catron and others).

25. **Botaurus lentiginosus.** BITTERN.— A few here last year (1909), which was a wet season.

26. **Ardea herodias.** GREAT BLUE HERON.— Both Grinnell and Catron reported that this species occasionally breeds along the Little Missouri River.

27. **Butorides virescens.** GREEN HERON.— One seen July 13.

28. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON. * — Several young of this year were seen on the Moreau River during the third week of August.

29. **Grus americana.** WHOOPING CRANE.* — Reported to be not infrequently seen during the spring migration.

30. **Grus canadensis.** LITTLE BROWN CRANE.[1] — Grinnell states that this species was occasionally seen on the plains, and that its nests were numerous in the pines of the Black Hills. Its present status may be described as "occasionally an abundant migrant."

31. **Rallus virginianus.** VIRGINIA RAIL.— One pair bred in a small reedy patch in the Cave Hills.

32. **Fulica americana.** COOT.— Rare, because of almost total absence of suitable resorts.

33. **Recurvirostra americana.** AVOCET.— Fairly abundant in migrations (Catron). Ten were seen flying low on August 23.

34. **Micropalama himantopus.** STILT SANDPIPER.— Seen on the South Fork of the Grand River August 17. Apparently only a migrant.

35. **Gallinago delicata.** WILSON'S SNIPE.— Common along the river early in September.

36. **Pisobia maculata.** PECTORAL SANDPIPER.— A common migrant.

37. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Several were seen on artificial ponds.

38. **Pisobia minutilla.** LEAST SANDPIPER.— Tolerably common in August.

39. **Totanus melanoleucus.** GREATER YELLOW-LEGS.* — A pair was seen July 19 on Little Missouri River. Catron reports that they are regular and not rare migrants.

40. **Totanus flavipes.** YELLOW-LEGS.— One seen with the preceding. Apparently only a migrant, in dry seasons at least.

41. **Helodromas solitarius.** SOLITARY SANDPIPER.— Rare breeder; abundant migrant. Found wherever there is water, in the buttes as well as on the plains.

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[1] Omitted by error from previous list.

42. **Bartramia longicauda.** UPLAND PLOVER.— Breeds sparingly in the drier western half, mainly in draws of foot-hills, but fairly abundantly in the eastern half.

43. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.* — Seen several times on the shallow pools in blow-outs after the heavy rain of August 15.

44. **Actitis macularia.** SPOTTED SANDPIPER.— Breeds sparingly. A common migrant. Seen after July 15 about almost every body of water.

45 **Numenius longirostris.** LONG-BILLED CURLEW.— Breeds. Frequently seen in the sparsely settled western part of the county. No longer found elsewhere.

46. **Oxyechus vociferus.** KILLDEER.— Very abundant breeder on the plains wherever moist ground occurs. Fledgelings observed as late as August 5.

47. **Ægialitis meloda.** PIPING PLOVER.* — One seen and heard on Boxelder Creek, July 17–18.

48. **Tympanuchus americanus.** PRAIRIE CHICKEN.— Fairly abundant resident in the valleys near the Short Pine Hills. Feeds almost solely on 'buffalo-berries' during their season, August and September.

49. **Bonasa umbellus umbelloides.** GRAY RUFFED GROUSE.— One seen in the Short Pine Hills. Fairly abundant in the Long Pine Hills.

50. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Very abundant resident along the permanent streams and in the park-like area at the top of the buttes and near their base. Broods this year contained about twelve. One nest was found in a clump of 'buck-bush' (*Symphoricarpus*). It was only a slight hollow. The stomach of a bird of the year, shot August 14 on the mesa of the South Cave Hills, contained 200 flying ants, 4 small (shorthorned) grasshoppers, 1 small beetle (Chrysomelidæ), 1 small caterpillar, 25 black currants, 50 pods of wild flax.

51. **Centrocercus urophasianus.** SAGE HEN.— Abundant resident in the areas covered with the scrub sage-bush (*Artemisia tridentata*), where water is not far distant; therefore mainly found on the terraces in the stream valleys. Eight live tapeworms, the largest a foot long, were taken from the body cavity of an adult female which, though in good health, was solitary.

52. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Though a common breeder in the groves along the streams it is but rarely seen in driving about the country.

53. **Carthartes aura septentrionalis.** TURKEY VULTURE.— Tolerably abundant summer resident about the higher buttes. Especially abundant about Slim Buttes, where thirty or forty were found roosting together in a large pine tree during the last week of August.

54. **Circus hudsonius.** MARSH HAWK.— A common summer resident on the plains.

55. **Astur atricapillus.** GOSHAWK.— One seen in the Cave Hills, August 12.

56. **Accipiter velox.** SHARP-SHINNED HAWK.— Common during the autumn migration, which commenced August 22.

57. **Accipiter cooperi.** COOPER'S HAWK.— Several seen early in September along the Little Missouri Valley.

58. **Buteo borealis calurus.** WESTERN RED-TAIL.— A common summer resident throughout the area.

59. **Buteo borealis krideri.** KRIDER'S HAWK.— Two were observed, apparently near their nest, at the cliff of the Cave Hills.

60. **Buteo swainsoni.** SWAINSON'S HAWK.— Abundant summer resident.

61. **Archibuteo lagopus sancti-johannis.** ROUGH-LEGGED HAWK. Seen July 14, and three or four times during the last of August and the first of September.

62. **Archibuteo ferrugineus.** FERRUGINOUS ROUGH-LEG.— Quite abundant on the plains. Nests in the buttes. Especially numerous after August 20.

63. **Aquila chrysaëtos.** GOLDEN EAGLE.— A common resident about the high buttes. Aeries were seen in the Cave Hills and in the Short Pine Hills.

64. **Haliæetus leucocephalus.** BALD EAGLE.— Rare. One seen July 20 on the Little Missouri.

65. **Falco mexicanus.** PRAIRIE FALCON.— Abundant summer resident in the badlands and elsewhere where clay cliffs occur.

66. **Falco peregrinus anatum.** DUCK HAWK.— Rare. Seen twice.

67. **Falco columbarius.** PIGEON HAWK.— Rare autumn migrant along the Little Missouri Valley.

68. **Falco sparverius.** SPARROW HAWK.— Abundant summer resident on the plains.

69. **Pandion haliaëtus carolinensis.** OSPREY.— One seen September 2 along the Little Missouri River.

70. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— Abundant resident in the badlands and about the steeper buttes.

71. **Asio flammeus.** SHORT-EARED OWL.— Grinnell reports that they saw several along the river bottom of the Little Missouri.

72. **Speotyto cunicularia hypogæa.** BURROWING OWL.— Abundant in some of the prairie-dog towns.

73. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— One observed July 11 in the Little Missouri Valley within six miles of the Montana line, and a short distance north of Harding County, in North Dakota.

74. **Ceryle alcyon.** KINGFISHER.— A few pairs nested along the Little Missouri River, and one on the largest stream of Cave Hills.

75. **Dryobates villosus.** HAIRY WOODPECKER.— Rare summer resident in the forested buttes and along the Little Missouri near Camp Crook.

76. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Much more frequently seen than the preceding.

77. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— An abundant summer resident in the groves of the Little Missouri Valley, and sparingly in the buttes.

78. **Colaptes auratus luteus.** NORTHERN FLICKER.— Breeds wherever trees occur; much more frequent east of the Little Missouri than west of it.

79. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— A common summer resident in and west of the Little Missouri Valley. Rare to the eastward.

80. **Phalænoptilus nuttalli.** NUTTALL'S POORWILL.— A frequent breeder in the high buttes. One was seen on the mesa of Cave Hills, one in badlands in Slim Buttes, and a third was flushed in an arroya at the base of Slim Buttes. They were heard each night during the two weeks spent about the Cave Hills.

81. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.— Common breeder in the plains.

82. **Aëronautes melanoleucus.** WHITE-THROATED SWIFT.— Several pairs nested on the high castellated buttes of Slim Buttes and a few at the north end of the East Short Pine Hills.

83. **Tyrannus tyrannus.** KINGBIRD.— Nests sparingly, usually in box-elder trees, wherever trees occur.

84. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Rare in the area under discussion. One pair nested in the foothills of the Cave Hills and two more in the extreme eastern and southeastern portions of the county. Their favorite nesting site, a small tree near a farm house on the plains, is almost lacking as yet.

85. **Sayornis saya.** SAY'S PHŒBE.— Abundant summer resident wherever cliffs occur. Therefore most numerous in the badlands.

86. **Myiochanes richardsoni.** WESTERN WOOD PEWEE.— Nests rarely in the forested parts of the high buttes.

87. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— One was seen in Slim Buttes August 20.

88. **Empidonax traillii.** TRAILL'S FLYCATCHER.— Nests, not frequently, along the Little Missouri and in cañons of the forested buttes.

89. **Empidonax minimus.** LEAST FLYCATCHER.* — A pair nested in a grove in a valley in Cave Hills.

90. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.— One of the four most numerous residents of the plains. A nest with four eggs was found July 15. We estimated that there were perhaps twenty-five adults to each section (640 acres) of land.

91. **Pica pica hudsonia.** MAGPIE.— Common resident in groves in the Little Missouri Valley and in cañons of the buttes which are filled with deciduous trees.

92. **Corvus corax principalis.** RAVEN.— Reported by Catron to be abundant at Camp Crook during the very coldest weather only. "Ravens were seen almost every day on the way to the Black Hills. They had bred on many of the lofty buttes that we passed." (Grinnell.)

93. **Corvus brachyrhynchos.** CROW.— A common migrant. This year a few nested near Camp Crook in the Little Missouri Valley. This is reported as exceptional.

94. **Nucifraga columbiana.** CLARKE'S NUTCRACKER.— Quite abundant summer resident in the forested Short Pine Hills.

95. **Cyanocephalus cyanocephalus.** PIÑON JAY.— Abundant breeder in the North Cave Hills. Not seen elsewhere in Harding County.

96. **Dolichonyx oryzivorus.** BOBOLINK.— Rare summer resident along the Moreau River. (Three were seen September 15 two hundred miles northwest of the area under discussion.)

97. **Molothrus ater.** COWBIRD.— Grinnell found this species numerous. We found it very rare.

98. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— An occasional migrant only, because of absence of reedy marshes.

99. **Agelaius phœniceus fortis.** THICK-BILLED RED-WING.— A common migrant. A few pairs nested in a tiny marsh in the North Cave Hills.

100. **Sturnella neglecta.** WESTERN MEADOWLARK.— Abundant nester on the plains and on the mesas of the buttes. We estimated that there were about ten pairs to each section of land.

101. **Icterus bullocki.** BULLOCK'S ORIOLE.— One pair was found nesting in a grove in the Little Missouri Valley July 20.

102. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Abundant breeder. Fifty or so fly around together after the breeding season. Ecologically they replace the Cowbird, the Redwing, the Grackle, and the Yellowhead. That is to say, they inhabit groves, etc., much as do the Grackles; they follow the plow, etc., as do the Yellow-heads; they hang about streams as do the Redwings; they follow the cattle as do the Cowbirds; and in addition, they wade in the water as do Snipe.

103. **Loxia curvirostra minor.** CROSSBILL.— A frequent summer resident wherever trees are plentiful. After the breeding season they fly about in flocks of twenty or thirty.

104. **Astragalinus tristis.** GOLDFINCH.— Not uncommon during the summer.

105. **Spinus pinus.** PINE SISKIN.— A small flock was seen early in September.

106. **Passer domesticus.** ENGLISH SPARROW.— Abundant in the only large town, Camp Crook, even when there was no railroad nearer than 80 miles.

107. **Calcarius pictus.** SMITH'S LONGSPUR.— Probably seen twice during July.

108. **Calcarius ornatus.** CHESTNUT-COLLARED LONGSPUR.— Abundant breeder on the plains of the eastern part of the county; less numerous westward.

109. **Rhynchophanes mccowni.** MCCOWN'S LONGSPUR.— Abundant on the plains. This and the preceding probably outnumber the Horned Larks. A nest containing young just hatched was found July 16.

110. **Poœcetes gramineus confinis.** Western Vesper Sparrow.— A common summer resident on the plains. Very frequently seen during the first half of September.

111. **Passerculus sandwichensis alaudinus.** Western Savannah Sparrow.* — Rare migrant, seen September 1–6.

112. **Ammodramus bairdi.** Baird's Sparrow.— Breeds rarely in the moister draws of the steppe. Common as a migrant towards the close of August and early in September. Collected.

113. **Ammodramus savannarum bimaculatus.** Western Grasshopper Sparrow.— Nests in the moister blue-stem swales of the eastern part of the area.

114. **Passerherbulus henslowi occidentalis.** Western Henslow's Sparrow.* — One seen September 4.

115. **Chondestes grammacus strigatus.** Western Lark Sparrow.— A common breeder in the groves along the streams. They left the region about August.

116. **Zonotrichia albicollis.** White-throated Sparrow.— A few were seen several times early in September.

117. **Spizella passerina arizonæ.** Western Chipping Sparrow.— Rare summer resident along the Little Missouri. Quite numerous in the Slim Buttes during the last half of August.

118. **Spizella pallida.** Clay-colored Sparrow.— Seen once in July on the plains.

119. **Spizella pusilla arenacea.** Western Field Sparrow.* — Not uncommon on the foothills of the higher buttes, where suitable situations occur — copses and grass. Occasional elsewhere.

120. **Junco aikeni.** White-winged Junco.— Common nester in the Short and Long Pine Hills. Fledgelings observed July 20 in the Long Pines.

121. **Melospiza melodia.** Song Sparrow.— Nests in each of the suitable localities about the buttes. Quite common as a migrant after August 21.

122. **Melospiza georgiana.** Swamp Sparrow.— One seen August 22 on the Moreau River.

123. **Pipilo maculatus.** Arctic Towhee.— Abundant breeder wherever woods occur.

124. **Zamelodia melanocephala.** Black-headed Grosbeak.— Abundant nester in those parts of the Little Missouri Valley which are well filled with cottonwood groves. One was observed to sing while flying, a song much resembling that of the Western Mockingbird.

125. **Passerina amœna.** Lazuli Bunting.— A rare breeder in the forested buttes.

126. **Calamospiza melanocorys.** Lark Bunting.— One of the most numerous summer residents of the plain. Most of the males have moulted by August first, when migration is under way. However, a mother was observed to feed a fledgeling as late as August 31.

127. **Piranga ludoviciana.** WESTERN TANAGER.— One seen August 27 in the Short Pine Hills.

128. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Abundant nester on the cliffs of badlands and along streams wherever such cliffs occur. The only swallow seen frequently.

129. **Hirundo erythrogastra.** BARN SWALLOW.— A pair or two nest about the sheds of each of the old ranches, and in Camp Crook. They do not wander far from their nests.

130. **Riparia riparia.** BANK SWALLOW.— One small colony is established on the North Fork of the Grand River.

131. **Bombycilla garrula.** BOHEMIAN WAXWING.— A large flock is reported to have spent several days in the Short Pine Hills during February, 1910.

132. **Bombycilla cedrorum.** CEDAR WAXWING.— A common summer resident in the pine-forested parts of the buttes.

133. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE. — Abundant summer resident of the plains. Nests in the scattered trees which occur along the intermittant "creeks."

134. **Vireo olivaceus.** RED-EYED VIREO.* — Not a rare nester in the wooded cañons of Slim Buttes.

135. **Vireosylva gilva swainsoni.** WESTERN WARBLING VIREO.— Common during the summer in the woody areas.

136. **Dendroica æstiva.** YELLOW WARBLER.— Nests commonly in the cañons along the brooks of the buttes, and along the Little Missouri.

137. **Dendroica auduboni.** AUDUBON'S WARBLER.— Nests in the pine forests of the higher buttes; fairly common.

138. **Seiurus aurocapillus.** OVENBIRD.[1] — Noted, not rarely, in the Short and Long Pine Hills. Fledgelings observed in the latter July 20.

139. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH.* — Three seen along the river early in September.

140. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT. — Breeds commonly along the permanent streams.

141. **Icteria virens longicauda.** LONG-TAILED CHAT.— Nested abundantly in the most wooded portions of the Little Missouri flood plain.

142. **Wilsonia pusilla.** WILSON'S WARBLER.* — An abundant migrant, arriving August 19.

143. **Anthus spraguei.** SPRAGUE'S PIPIT.— Common breeder on the grassy plains of the northeastern part of the county. Abundant migrant. The call, *ché, ché,* is then frequently heard.

144. **Dumetella carolinensis.** CATBIRD.— Not common during the summer, in the groves along the streams.

145. **Toxostoma rufum.** BROWN THRASHER.— More numerous than the preceding, in similar situations.

146. **Salpinctes obsoletus.** ROCK WREN.— Breeds abundantly

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[1] Omitted by error from previous list.

wherever steep slopes with crevices occur. Hence especially noticeable in badlands and on the cliffs of the steep-sided buttes.

147. **Troglodytes aëdon parkmani.** WESTERN HOUSE WREN.— Nests abundantly in the more wooded portions of the Little Missouri Valley and in the pine forests of the high buttes.

148. **Sitta canadensis.** RED-BELLIED NUTHATCH.— A common resident in the pines of the buttes.

149. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— Breeds abundantly in the forests of the buttes. Common later in the woods elsewhere.

150. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— Rare migrant.

151. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.* — Not uncommon along the Little Missouri, August 27–September 3.

152. **Planesticus migratorius.** ROBIN.— Breeds tolerably commonly in the buttes and along the Little Missouri River.

153. **Sialia sialis.** BLUEBIRD.— Common breeder in the pines of the higher buttes.

154. **Sialia currucoides.** MOUNTAIN BLUEBIRD.— A brood was seen in the Short Pine Hills. Grinnell also reports seeing a brood of young there in 1874.

DOUBLE-CRESTED CORMORANTS BREEDING IN CENTRAL ILLINOIS.[1]

BY FRANK SMITH.

THE Double-crested Cormorant (*Phalacrocorax auritus*) is well known in Illinois as an abundant migrant along the Illinois River bottomlands in both spring and autumn, when flocks of several hundred may sometimes be seen for periods of several weeks taking heavy toll from the fish life of the region.

The southern limit of their breeding range east of the Mississippi River seems to be not very well known. Kumlien and Hollister in 'The Birds of Wisconsin' (1903) suggest that they probably nest in certain counties in the northern part of that State and cite

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[1] Contributions from the Zoölogical Laboratory, University of Illinois, under the direction of Henry B. Ward, No. 6.

Carr (1890) as authority for the statement that they breed about some of the larger isolated lakes in the northern and central part of the State. No reference has been found by the writer to their breeding in Illinois but there is pretty good evidence that they have bred in small numbers more or less regularly for several years in the Illinois River bottomlands near Havana, the site of the Illinois Biological Station. The breeding locality is about thirty miles south of Peoria.

The writer first learned of cormorants nesting there, on June 18, 1909, when in company with a party of naturalists of the State he was shown a family of living young birds pretty well grown which with the nest had been brought to Havana from the vicinity of Clear Lake, about twelve miles up the river. We were told that there were other nests with young in the same locality. Mr. Frank C. Baker of the Chicago Academy of Science secured the specimens and took them to Chicago where the photograph which is the original of an accompanying illustration was made by Mr. F. M. Woodruff.

In July, 1910, the writer, in company with Professor Charles F. Hottes of the botanical department of the University of Illinois, visited each of the only two nesting places which we could locate. We found a total of nine nests of which two contained eggs and none had nestling birds. We learned that at least one set of eggs had been taken by a fisherman earlier in the summer.

The opening of the Chicago Drainage Canal about ten years ago has been followed by permanently higher water levels in the lower part of the Illinois River valley and many former bottomland marshes and swamps have been converted into wide stretches of open water. This has been accompanied by the death of many of the trees growing at certain levels. In both of the nesting places visited, the birds had selected dead trees which were standing in open water a few feet deep and from which the open water with scattering dead trees extended for long distances in various directions.

The first nesting place visited was at Clear Lake, about twelve miles north of Havana and in the same vicinity as that from which the young birds had been taken the preceding summer. At the time of the visit, July 2, 1910, two dead ash trees but a few rods apart contained each two nests. Of the two nests in each tree one was empty and the other contained a set of three eggs. The eggs of neither set had been long incubated but the nests were apparently deserted and no living cormorants were seen in the immediate vicinity. A dead adult hanging from a limb of a tree near-by gave reason for the supposition that the little colony had been broken up by hunters or fishermen. About a half mile from these two trees another tree was found which contained two nests, both empty. Five adults were seen flying or swimming near-by. The six nests referred to above were from twenty-four to thirty-two feet above the water but could not well be placed higher as all the trees of the immediate vicinity were rather small.

On July 14, 1910, a visit was made to a nesting place about five miles north of Havana at the head of Dogfish Lake where two tall dead cottonwood trees were found in close proximity, one of which had one nest and the other had two nests. One of the latter was dislodged during a violent wind storm after our arrival but before the photograph was taken. The nests were at least fifty feet above the water.

Soon after the storm had passed and before we had gone very near to the nests, small flocks of cormorants from neighboring lakes began arriving and finally twenty-one of them were perched in the two nest-bearing trees before we disturbed them by our approach. None of them seemed to pay any special attention to the nests, and as we afterwards saw no signs of life therein we conjectured that young birds might already have been reared and have left the nest and were perhaps included in the flocks. We could not get near enough to determine whether or not any of them were juvenile. It was nearly a month later in the season than the time at which well grown birds had been found the preceding year.

Although this latter nesting place was much nearer to Havana than the first one, it was not in the line of regular travel, was not known to as many people, and I have no knowledge of the birds having been molested.

Inquiries among fishermen and hunters disclosed the fact that cormorants' nests have been built in the Havana region for a number of years past and while it was difficult to get very definite information we found reason for believing that there was a somewhat close relation between the beginning of the cormorants' nesting in the region and the dying of large numbers of trees after the opening of the Chicago Drainage Canal. There is very little probability that they remained in the vicinity during the summers of 1894–98, as the writer and various other persons who were familiar with birds and who worked at the Illinois Biological Station during those seasons did not see them except during migration, while during the past two summers they were frequently seen near the Station throughout July and August. The Station was not located at Havana during the interval between the years 1900 and 1909.

The fishermen of the region know these birds as Nigger Loons and detest them because of their destructiveness to fish. They were rather reticent but there seemed good reason for inferring that the Clear Lake colony had been "shot out" and it seems hardly probable that the establishment of large breeding colonies would be permitted.

THE WARBLERS IN WAYNE COUNTY, MICHIGAN, IN 1909.

BY J. CLAIRE WOOD.

BUSINESS confined the writer mainly to River Rouge Village during the spring of 1909. In the adjacent village of Ford an orchard extended from the Detroit River westerly into Ecorse Township and terminated near a small piece of timber; all being on what is known as Private Claims 112 and 113. Here, spare afternoons were devoted to warbler observations. May 16 and 23 were spent five miles inland on P. C. 32, Ecorse Township. This woods is about one mile long and one end lies in the bottom lands of the River Rouge, the home of a pair of Red-shouldered Hawks and Green Herons. The two above localities will be designated respectively as the river district and the inland district, while the autumn river district refers to some twenty acres of woods on Section 24, Monguagon Township, eight miles south of the spring district. No such intensive observation was given the autumn migration, both the waders and the raptores receiving a share. An accident confined me to the house during the first two weeks in October but the inland district was carefully worked October 16 and 17 with gratifying results. I tried again October 24 but saw nothing except Myrtle Warblers and abandoned the warblers for the year.

The last week in April was cold and cloudy, culminating on the night of the 28th and morning of the 29th in the greatest snowfall so late in the season in the history of the local weather bureau, covering 26 years. A very brisk wind with the temperature at 37° and an almost continuous snowstorm distinguished May 1, and the 2d was very similar except that it did not snow as much. Unfavorable as these conditions were the warblers began to arrive, the Palm and Myrtle late but the Black and White and the Yellow about on time. The wholly transient migration terminated between two days. Seven species were present May 27 and four on the 29th. May 30 we spent all day in the inland district, but the only wholly transient of any kind was a female Philadelphia Vireo, though such warblers as the Cerulean and Golden-winged were still migrating. May 16 was distinctly warbler day. In the heart of the woods on the inland district they were congregated on the ground along the margin of a water-covered section and the same day similar conditions were observed by Mr. Bradshaw H. Swales on Grosse Isle, and by Mr. Jefferson Butler on Belle Isle. A brisk wind was blowing causing much swaying of branches and vibrating of leaves above but whether it was the insects or the warblers that were forced down could not be determined. Such a congestion of warblers I do not expect to see again. There were hundreds of them within a hundred yard radius. Hopping here and there or quickly fluttering over one another or jumping into the air to capture a passing insect the general effect, as one glanced along the forest floor, was a suggestion of whirling and drifting autumn leaves. There was a perceptible west to east movement, a few continually arriving and departing. We watched them several hours but could detect no immature birds nor abnormal plumages. Twenty-two species were counted, the greater number being Chestnut-sided and Blackburnian, closely followed by Magnolia and Black-throated Green, while at the other extreme were the Tennessee, Orange-crowned, Parula and Cape May.

The sexes are so near alike in such warblers as Nashville, Tennessee, Orange-crowned and Palm that even in spring, without the birds in hand, no one can acquire an accurate idea of the relative abundance of the two sexes, nor the amount of time the males precede the females, while in autumn, age becomes an important factor. Age and sex were determined from specimens collected and constitute the value of the following list.

Black and White Warbler (*Mniotilta varia*).— The river district was not suitable and only five were observed all spring, a male May 1, two on the 2d and a pair on the 19th. Common inland both spring and autumn. Noted a male and female October 16. Not observed during the summer.

Golden-winged Warbler (*Vermivora chrysoptera*).— A common summer resident in some sections. Forty-five were counted in the large flock May 16, which is the most I have seen together. Last for the year, August 22, when twelve were counted, including old, young and both sexes.

Nashville Warbler (*Vermivora rubricapilla*).— The two seen May 8, and the four on the 9th, were males. Fourteen, May 15, were of both sexes and the most seen in one day. Eleven, May 19, were the last in spring. Seen only on the river district in autumn; an adult male September 12 and another on the 19th.

Orange-crowned Warbler (*Vermivora celata*).— Three in the large flock, May 16, the two examined being a male and female.

Tennessee Warbler (*Vermivora peregrina*).— Tolerably common on the river district May 15 to 27, both inclusive. The females appeared with the males from the first day and in equal numbers. A male in the large flock May 16 and two in the same woods May 23 were the only inland records for the year. An immature bird, September 12, in the river district was the only autumn record. I have given the warblers close attention, beginning with the autumn of 1904. This warbler was absent that autumn but the most common woodland transient during the following four years in autumn, and rare or absent in spring.

NORTHERN PARULA WARBLER (*Compsothlypis americana usneæ*). — Three females in the large flock, May 16, and a junior female in the same woods October 16. An adult male on the river district September 19. The local birds are referable to Ridgway's proposed form *ramalinæ* which was not accepted in the A. O. U. Check-List and we revert to *usneæ*.

CAPE MAY WARBLER (*Dendroica tigrina*).— A male and female in the large flock of May 16. In the same woods an adult male was noted October 16 and another on the 17th. Two adult males noted in the river district August 29.

YELLOW WARBLER (*Dendroica æstiva*).— A single bird was seen April 27 and the second May 2. The first females appeared May 9 when the species became common and established for the summer. An adult male seen August 15 was the last for the year.

BLACK-THROATED BLUE WARBLER (*Dendroica cærulescens*).— Two males and three females on the river district May 19. Four males and three females in the large flock, May 16, and six females in same woods May 23. More common in autumn, the season opening with a female August 29 and closing with two males and two females October 17.

MYRTLE WARBLER (*Dendroica coronata*).— Common on the river district. Noted a female April 25 and a male and female on the 28th. Twenty-five counted May 1, in numbers about equally divided as to sex. Only four females among the thirty May 8 but sexes about equally divided on other dates, including the fifteen May 19, which were the last in spring. Not seen inland though I expected to find a few in the large flock of May 16. Common, both along the river and inland in autumn. Counted thirty October 24, and they undoubtedly remained later.

MAGNOLIA WARBLER (*Dendroica magnolia*).— In the river district a male was noted May 15, flocks, including both sexes, May 19 and 27, and one female May 29. Common inland. The numbers estimated in the large flocks of May 16 was 175. Seen August 29 to September 12 in the river district; all junior birds after the former date.

CERULEAN WARBLER (*Dendroica cerulea*).— First seen in the large flock of May 16, when 46 were counted. Last seen August 22, three adult males and a junior female. June 20, we were locating a Cooper's Hawk's nest in a long narrow piece of woods on P. C. 24, Grosse Pointe Twp., when I heard the song of a Cerulean. A systematic search disclosed two nests, one containing three and the other four eggs; both were complete sets as incubation was far advanced.

CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*).— Three in the river district, May 15, were the first seen, and two on the 27th were the last of the spring migration. This species was the most abundant of all the warblers in the flock of May 16. A conservative estimate, agreed upon by Mr. Herbert H. Spicer and the writer, fixed their numbers at 300. Seen twice in summer. June 13, while locating a Marsh Hawk's nest in a bushy tangle with many openings grown to marsh grass in Gratiot Twp., a female Chestnut-sided acted as if breeding, and a male was noted in the same locality July 25. A junior male in the river district, September 12, was the only autumn record.

BAY-BREASTED WARBLER (*Dendroica castanea*).— Three males, on the river district, May 15; also, three on the 19th and one on the 27th. The eight in the large flock of May 16 were males. Females were seen only May 23. Not observed in autumn until September 12, when twelve were seen. A female was taken October 16 and another on the 17th. No adults seen during the autumn.

BLACK-POLL WARBLER (*Dendroica striata*).— This species has always been rare in spring and our most common autumn migrant, owing to its uniform and unfailing abundance. Two males on the river district, May 29, and one male inland, May 23. Fifty-nine were counted on the river district August 29 and consisted of juniors and adults. The last were three junior birds, September 26, which was my last day afield until October 15. I believe the four warblers seen October 16 were of this species but they were not taken.

BLACKBURNIAN WARBLER (*Dendroica fusca*).— Five males on the river district, May 19, but only two males among the fifteen seen May 27. Inland, 260 were counted in the large flock of May

16, and they were still common on the 23d, the sexes being about equal in numbers. An adult and a young male were noted in this woods August 22. On the river district three junior birds seen August 29, ten, mostly adults, September 12, and an adult male September 19.

Black-throated Green Warbler (*Dendroica virens*).— The twenty-five counted May 8 and 9 were mostly males, after which the sexes were about equally divided in numbers. A male May 29 was the last in spring. In the large flock of May 16, 180 (estimated). First autumn individual noted September 5, and seven on the 6th; all junior birds. October 16, two adult males and two junior males were noted, and on the 17th, one adult male and female, three junior males, and one junior female.

Palm Warbler (*Dendroica palmarum*).— Tolerably common on the river district. The four noted May 1 and one May 2 were all males. May 8 only three of the eighteen seen were examined and these were males. The fourteen seen May 9 consisted of four males and ten females. No males observed after this date, the season closing with three females May 15. Two females in the large inland flock of May 16. Absent in autumn. Somewhat rare in autumn and entirely absent some years. Tolerably common only September 20 and 27, 1908.

Ovenbird (*Seiurus aurocapillus*).— The river district is not suitable for them and none were seen until the inland visit May 16, when nine were counted, and eighteen mated pairs on the 23d. An adult male, September 26, was the last for the year. July 4, I was stalking a Green Heron on P. C. 404, Gratiot Twp., when an Ovenbird flushed from her nest containing four slightly incubated eggs — rather late.

Water-Thrush (*Seiurus noveboracensis*).— No suitable territory for this species was visited during the year, which accounts for its rarity on this list. A female was flushed from a bush pile on high ground May 19, another in a flock of Redstarts August 15, and the first autumn transient and a third female on the 29th were all we noted during the year.

Louisiana Water-Thrush (*Seiurus motacilla*).— Two inland, May 16, were the only ones seen during the year. This species is a summer resident in certain restricted areas.

Connecticut Warbler (*Oporornis agilis*).— One male, in the inland district, May 23.

Maryland Yellow-throat (*Geothlypis trichas*).— Not seen until May 15, after which it became common. On P. C. 344, Gratiot Twp., I found a nest containing three pipped eggs, one young and a young Cowbird. Mr. Spicer found a nest with three eggs on P. C. 618, same Twp., June 6.

Wilson's Warbler (*Wilsonia pusilla*).— Tolerably common on the river district May 15 to 29. No females seen until the 27th, and the four seen on the 29th were two males and two females. Two noted in the large flock of May 16. An immature bird on the river district September 6, was the only autumn record.

Canadian Warbler (*Wilsonia canadensis*).— On the river district a male was noted May 15, two males and a female May 19, and five males and a female May 27. Common inland May 16 and 23. A female, August 29, was the only autumn record.

Redstart (*Setophaga ruticilla*).— The first seen for the year was a male May 9, and the last were two females October 17. Only exceeded by *D. æstiva* in abundance as a summer resident. June 6, on P. C. 620, Gratiot Twp., Mr. Spicer and the writer were locating chats near some twenty acres of woods that has always been a favorite Redstart haunt. Later in the day we walked through this woods and in less than an hour found a set of one, two sets of three, six sets of four, and one of five, besides seeing five nests with the birds on that we failed to reach, and eight unfinished nests.

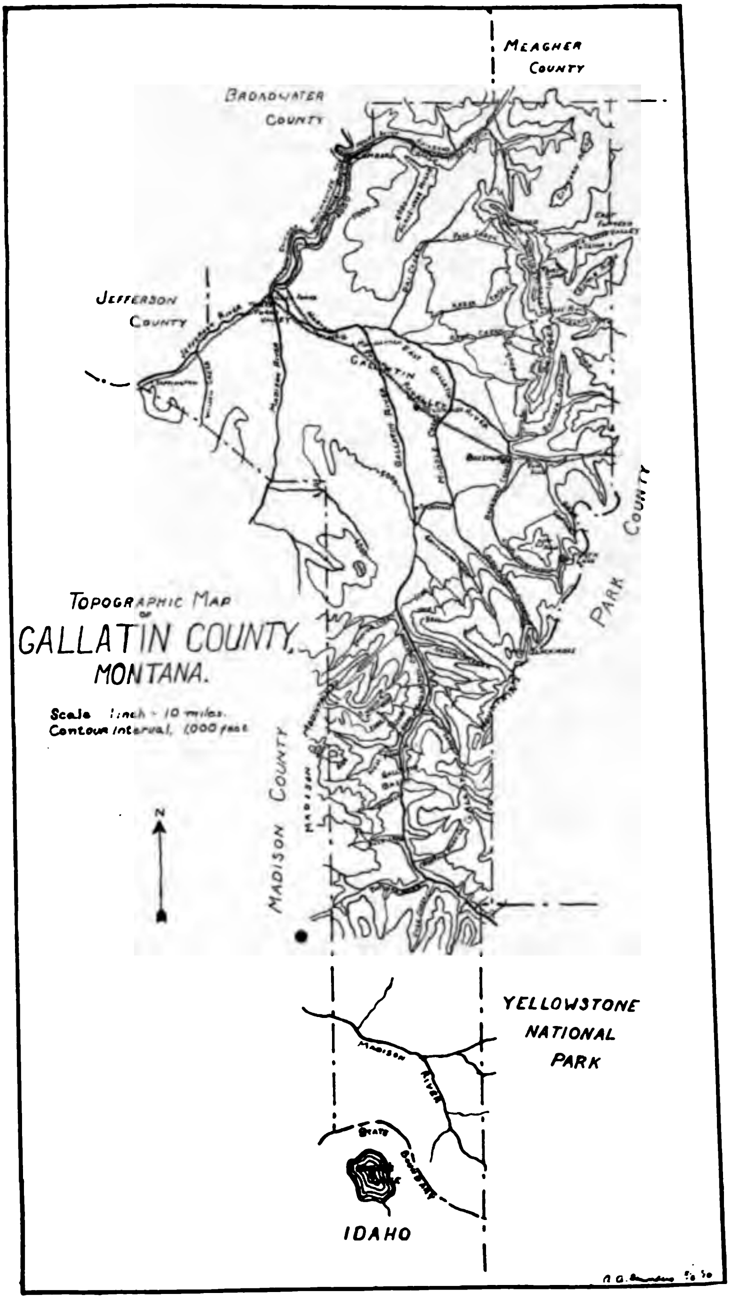
A PRELIMINARY LIST OF THE BIRDS OF GALLATIN COUNTY, MONTANA.

BY ARETAS A. SAUNDERS.

GALLATIN COUNTY lies in what has been termed south-central Montana. Its southern extremity is formed by the juncture of the Montana-Idaho State line with the western border of the Yellowstone National Park. From here it extends north to Lombard on the upper Missouri River, including practically the entire drainage of the Gallatin River, the lower portions of the Madison and Jefferson Rivers and a small portion of the upper Missouri River. The eastern boundary of the county practically coincides with the main divide between the Yellowstone and Missouri River drainages, except in the northeastern part of the county where it includes, in Brackett and Flathead Creeks, a small part of the Yellowstone drainage.

This territory extends from an elevation of 4,000 feet on the Missouri River to nearly 11,000 feet in some of the higher peaks of the Gallatin and Madison ranges. It includes many types of country but in the main may be divided into two large divisions, the valleys and the mountains. There are three main valleys in the county, the Gallatin and Three Forks Valleys in the northwestern part and what is known as the East Flathead Valley in the northeastern part.

The Gallatin Valley extends from the northern and western mountain slopes, north along the Gallatin River and its tributaries to about the vicinity of Logan. It is the most productive grain-growing region of Montana and consists principally of broad wheat fields crossed by many irrigating ditches. The common breeding birds of these fields are the Killdeer, Western Meadowlark, Bobolink, and Western Vesper and Savannah Sparrows. About the clusters of buildings other species such as the Arkansas Kingbird, Barn and Cliff Swallows, Western House Wren and Mountain Bluebird are abundant. Along the larger streams are cottonwood groves which attract such species as the Kingbird, Western Wood Pewee, Least Flycatcher, Cassin's Purple Finch,


MEAGHER COUNTY
BROADWATER COUNTY
JEFFERSON COUNTY
TOPOGRAPHIC MAP OF
GALLATIN COUNTY.
MONTANA.
Scale 1 inch = 10 miles.
Contour interval, 1,000 feet
N
MADISON COUNTY
PARK COUNTY
YELLOWSTONE NATIONAL PARK
MADISON RIVER
STATE BOUNDARY
IDAHO

Pine Siskin, Western Chipping Sparrow, Western Warbling Vireo, Yellow Warbler and Western Robin. Most of these species are abundant in the cottonwood shade trees in the streets of Bozeman. In many places along the streams there are extensive thickets of willow and alder, often swampy in character. These thickets attract a larger number of species than any other type of country. The commoner species are Wilson's Snipe, Mourning Dove, Marsh Hawk, Western Crow, Magpie, Brewer's Blackbird, Western Goldfinch, White-crowned Sparrow, Mountain Song Sparrow, Slate-colored Fox Sparrow, Arctic Towhee, Black-headed Grosbeak, Yellow Warbler, MacGillivray's Warbler, Western Yellowthroat, Redstart, Catbird, Long-tailed Chickadee, Willow Thrush and Western Robin.

The Three Forks Valley lies at the head of the Missouri River and along the lower Madison and Jefferson Rivers. It is much lower than the Gallatin Valley, the average elevation being little over 4,000 feet. Only a small part of this valley is under cultivation. The soil averages much coarser and less fertile than the Gallatin Valley and there is a larger percentage of rolling grass land more suitable for grazing than agriculture. For this reason and also probably partially because of the elevation, there are several species quite common here, which occur rarely, locally or not at all in the Gallatin valley. Some of these are the Long-billed Curlew, Mountain Plover, Desert Horned Lark, Yellow-headed Blackbird, Western Grasshopper Sparrow and Lark Bunting. Water and shore birds are more abundant here, particularly in migrations, than in other parts of the county. I have had but few opportunities to visit this valley and believe that many additional facts and species will be found here later.

The East Flathead Valley is of higher elevation than either of the others, averaging about 5,600 feet. A large part of this valley consists of broad flat sagebrush land and because of this, it is the only part of the county where such species as the Sage Grouse, Sage and Brewer's Sparrows and Sage Thrasher are at all common.

The mountainous portions of Gallatin County consist principally of three main ranges. These are the Gallatin and Madison Mountains on the east and west sides of the Gallatin River in the southern part of the county, and the Bridger Mountains, west of the

Gallatin Valley, in the northeastern part of the county. Beside these there are the Horse-shoe Hills, of much lower elevation, just north of the Gallatin Valley. The elevation of the mountains extends from 5,000 feet in the lower foothills to nearly 11,000 feet in the higher peaks. They consist of long slopes clothed with dense evergreen forests, dotted by mountain meadows and small lakes and broken by high rocky ridges and deep cañons, the latter containing many swift streams and waterfalls.

The foothills, lying along the lower slopes next to the valleys, are grown with groves of aspen, thickets of thorn, service berry and wild rose, sagebrush and scattered clumps of Douglas fir. The commoner breeding birds of the foothills are the Canadian Ruffed Grouse, Lewis's Woodpecker, Red-shafted Flicker, Red-naped Sapsucker, Wright's Flycatcher, Magpie, Cassin's Purple Finch, White-crowned Sparrow, Arctic Towhee, Green-tailed Towhee, Lazuli Bunting, Western Yellowthroat, MacGillivray's Warbler and Catbird.

The cottonwoods, willows and alders of the valleys extend into the lower mountain cañons and form groves and thickets, the latter often as high as 7,500 feet, where such birds as the Desert Sparrow Hawk, Rufous Hummingbird, Hammond's Flycatcher, Pine Siskin, White-crowned Sparrow, Mountain Song Sparrow, Lincoln's Sparrow, Pileolated Warbler, Redstart, Long-tailed Chickadee and Western Robin are breeding birds. Along the mountain streams the Dipper and Spotted Sandpiper are common, while in the limestone cliffs forming the cañon walls such species as the Duck Hawk, Violet-green Swallow and Rock Wren breed.

The mountain forests are composed principally of lodgepole pine (*Pinus murreyana*), Douglas's fir (*Pseudotsuga taxifolia*), and Engelmann's spruce (*Picea englemanni*) with other species such as limber pine (*Pinus flexelis*) and alpine fir (*Abies lasiocarpa*) forming alpine forests near timber line. The common breeding birds of the mountain forests are Dusky Grouse, Canadian Ruffed Grouse, Western Red-tailed Hawk, Rocky Mountain Hairy Woodpecker, Batchelder's Woodpecker, Alpine Three-toed Woodpecker, Black-headed Jay, Rocky Mountain Jay, Clark's Nutcracker, Rocky Mountain Pine Grosbeak, Cassin's Purple Finch, Pine Siskin, Western Chipping Sparrow, Pink-sided Junco, Western Tanager, Western Warbling Vireo, Audubon's Warbler, Rocky Mountain Creeper, Mountain Chickadee, Ruby-crowned Kinglet, Western Golden-crowned Kinglet, Townsend's Solitaire, Olive-backed Thrush, Audubon's Hermit Thrush, and Western Robin. Most of these species are more abundant about the edges of mountain parks than in the forests themselves. The Pine Grosbeak occurs, in the breeding season, only in the alpine forests and the Nutcracker is more abundant here than elsewhere. The Cassin's Purple Finch, Western Tanager, and Ruby-crowned Kinglet show a decided preference for forests of Douglas fir to that of any other species, while the Golden-crowned Kinglet and Rocky Mountain Creeper are most abundant in tall spruces along the cañon bottoms.

In compiling this list I have consulted, I believe, all the previously published records from this region. The earliest records are contained in government publications. One of these[1] contains records of several species of shore birds from the vicinity of Fort Ellis, of the occurrence of which there are at present no other records, though the species are probably not uncommon in the region. The most complete and most important work on the birds of this region which has hitherto been published is 'The Birds of South-Central Montana,' by C. W. Richmond and F. H. Knowlton.[2] This list consists of 111 species, nearly all of which were recorded from Gallatin County. The observations were made in 1888 and 1890 and reveal a number of interesting and important changes in the bird life of the region since that time. In addition to this, two short articles on birds in the vicinity of Salesville, by A. M. Pyfer, appeared in 'The Oölgist.'[3] One of these contains the only present record of the Snow Bunting in this region.

A number of valuable records in this list were obtained from an examination of the collection of birds at the Montana Agricultural College at Bozeman, most of which was made in Gallatin County.

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[1] Report of a Reconnaissance from Carroll, Montana, to the Yellowstone National Park and return. Gov't. Printing Office, 1876. Zoölogy, by George Bird Grinnell.

[2] Auk, Vol. IX, 1894, pp. 298–308.

[3] The Nesting of Clark's Nutcracker. The Oölogist, Vol. XIV, 1897, pp. 100–110, and Birds of Montana. The Oölogist, Vol. XV, 1898, pp. 14, 15.

The remaining data were obtained from various sources but principally from the observations of Mr. Gerald B. Thomas and myself. Mr. Thomas was in this region from the fall of 1908 to August, 1909, while my own stay lasted from July, 1908, to August, 1909, with a few short visits since that date. During that time I was assigned to work on the Gallatin National Forest and had a good opportunity to cover nearly all parts of the county.

The migration data given in this list are taken largely from my own notes in the fall of 1908 and spring of 1909. Observations this spring (1910), somewhat further west in Montana, seem to indicate that the 1909 dates were unusually late. For this reason most of the species will probably be found to arrive a week or two earlier, in ordinary years, than the dates indicated in the list.

The accompanying map shows all the localities mentioned in the list. Since elevation is an important factor in the bird life of the region, I have shown this on the map by contour lines at an interval of 1,000 feet, obtaining the data for this from the U. S. Geological Survey sheets, except in the extreme southern part of the county where no data are yet available.

The problem of subspecies in this region is in many cases rather difficult. For this reason I have marked with an asterisk all forms whose subspecific identities have been determined by the examination of specimens from the region. In all other cases the subspecies are assumed.

I wish to acknowledge my indebtedness to the following persons: to Dr. L. B. Bishop for the identification of subspecies and for the use of his library in preparing this list; to Prof. R. A. Cooley and Mr. Wyatt Jones of the Montana Agricultural College for permission to examine the collection of birds there and for much help and information from their observations; to Mr. Gerald B. Thomas for the use of his many notes and observations; and to the Forest Officers of the Gallatin National Forest for information, help and encouragement given me whenever possible.

List of Species.

1. **Colymbus holbœllii.** HOLBŒLL'S GREBE.— I obtained a specimen of this bird which was shot on the Madison River, near Three Forks, on Oct. 17, 1909, by Mr. J. B. Pitts.

2. **Colymbus nigricollis californicus.** EARED GREBE.— I noted a bird of this species on Mystic Lake, Aug. 3, 1909.

3. **Podilymbus podiceps.** PIED-BILLED GREBE.— I saw two of these birds on a small pond near the lower end of Middle Creek Cañon on Aug. 29, 1908.

4. **Gavia immer.** LOON.— Prof. R. A. Cooley told me of a young bird of this species, which was captured alive in the Gallatin Valley.

5. **Larus californicus.** CALIFORNIA GULL.— Seen by Richmond and Knowlton on the Jefferson River in September, 1888.

6. **Larus delawarensis.** RING-BILLED GULL.— Mr. G. B. Thomas noted gulls of this species at Three Forks in June, 1909.

7. **Hydrochelidon nigra surinamensis.** BLACK TERN.— A specimen of this bird, taken just south of Bozeman in the Gallatin Valley, is in the collection at the Montana Agricultural College.

8. **Phalacrocorax auritus.** DOUBLE-CRESTED CORMORANT.— I saw several birds of this species on the Missouri River near Lombard on April 22 and 23, 1909.

9. **Pelecanus erythrorhynchos.**— WHITE PELICAN.— Mr. Chas. Smith of Bozeman told me that he remembered seeing a bird of this species that was shot on a small pond near Fort Ellis about thirty years ago.

10. **Mergus americanus.** AMERICAN MERGANSER.— Two birds of this species, taken on the East Gallatin River, were mounted and on exhibition for a short time, in a store window in Bozeman.

11. **Mergus serrator.** RED-BREASTED MERGANSER.— Richmond and Knowlton recorded this species as noted several times during August and September. I noted it but once, on the Missouri River near Lombard, April 22, 1909.

12. **Lophodytes cucullatus.** HOODED MERGANSER.— Several persons have described this species to me as occurring in pairs throughout the summer on the larger mountain streams. It is probably a regular summer resident in these localities. There is a young bird of this species, taken on Fairy Lake in the Bridger Mountains, in the collection at the Montana Agricultural College.

13. **Anas platyrhynchos.** MALLARD.— An abundant summer resident, breeding commonly in all suitable localities. It appears first in the latter part of March and is abundant until November. It winters occasionally, wherever the streams remain open. I noted it near Sappington on the Jefferson River on Feb. 12, 1910.

14. **Mareca americana**. BALDPATE.— Abundant migrant and occasional summer resident. I noted this species commonly from April 25 to May 14, 1909. Mr. Thomas found a nest of this species on the East Gallatin River, near Bozeman.

15. **Nettion carolinense.** GREEN-WINGED TEAL.— Abundant migrant and probably common as a summer resident, as I have noted it in large numbers as early as Aug. 17, 1909. It arrives early in April and leaves in October.

16. **Querquedula discors.** BLUE-WINGED TEAL.— Common summer resident. More abundant in summer than any other species of duck.

17. **Querquedula cyanoptera.** CINNAMON TEAL.— I noted a male of this species near Fort Ellis on May 14, 1909. Mr. H. A. Cleaveland of Bozeman has shot this species on the Madison River just south of the Gallatin County boundary. It is probably a regular but not common migrant.

18. **Spatula clypeata.** SHOVELLER.— An abundant migrant. On April 22 and 23, 1909, I found this species more abundant than any other duck along the upper Missouri River.

19. **Dafila acuta.** PINTAIL.— I have not met this species, but it is reported by all hunters to be a common migrant. It is said to breed in this region occasionally.

20. **Aix sponsa.** WOOD DUCK.— This species has been taken by local hunters on the East Gallatin River, during migrations. Prof. Cooley saw a pair that were evidently breeding in one of the mountain cañons south of Bozeman.

21. **Marila americana.** REDHEAD.— Reported rather commonly by local hunters. I noted this species on the Gallatin River in the Lower Basin about the West Fork and Beaver Creek on June 29 and 30, 1909.

22. **Marila vallisineria.** CANVAS-BACK.— Mr. H. A. Cleaveland has shot this species on the Madison River in Gallatin County.

23. **Marila affinis.** LESSER SCAUP DUCK.— Regular migrant. I noted this species near Fort Ellis several times during May, 1909.

24. **Clangula clangula americana.** GOLDEN-EYE.— A regular winter resident on the Missouri and Jefferson Rivers wherever the swifter parts of the streams remain open. It remains in spring until late in April.

25. **Charitonetta albeola.** BUFFLE-HEAD.— I have not met this species but it is reported quite commonly by local hunters.

26. **Chen rossi.** Ross's GOOSE.— Mr. Thomas saw a photograph of a bag of game shot at Three Forks by a local hunter in which a bird of this species showed plainly. The bird was said to be one of a flock of eight.

27. **Branta canadensis.** CANADA GOOSE.— An abundant migrant. Said to breed along the Madison River.

28. **Olor columbianus.** WHISTLING SWANS.— Swans are regular migrants on the Madison and Jefferson Rivers. Owing to the recent rarity of the Trumpeter Swan, *O. buccinator*, I have assumed that these birds are of the other species although I have examined none of them. It is probable that both species have occurred in the county and the Trumpeter may even have bred on some of the small lakes. Mr. H. A. Cleaveland told me that in August, 1885, he saw a number of swans with young not yet able to fly on Henrys' Lake, Idaho, just over the divide from Gallatin County.

29. **Botaurus lentiginosus.** BITTERN.— Recorded by Richmond and Knowlton. I have not noted this species.

30. **Ardea herodias.** GREAT BLUE HERON.— Summer resident. I found this species very abundant about Lombard and Three Forks in April, 1909. A small colony breeds in the cottonwoods along the upper Missouri River.

31. **Grus mexicana.** SANDHILL CRANE.— Mr. Wyatt Jones told me that this species formerly bred in aspen groves in the East Flathead Valley near Sedan.

32. **Porzana carolina.** CAROLINA RAIL.— I noted a pair of these birds in a swamp near Sedan on June 4, 1909.

33. **Fulica americana.** COOT.— I noted a bird of this species on Middle Creek, May 26, 1909.

34. **Lobipes lobatus.** NORTHERN PHALAROPE.— Richmond and Knowlton took this species at a mountain pool in September.

35. **Steganopus tricolor.** WILSON'S PHALAROPE.— I noted a pair of these birds near Sedan on several occasions in June, 1909. They were evidently breeding but I was unable to locate the nest.

36. **Recurvirostra americana.** AMERICAN AVOCET.— A regular migrant. Quite common in the Gallatin Valley in August.

37. **Gallinago delicata.** WILSON'S SNIPE.— Summer resident. These birds breed rather commonly in willow swamps in the valleys. During May and June the males may be seen commonly circling through the air and performing their curious wing-notes. Mr. Lea Marston showed me a nest of this species near Sedan. Mr. Thomas saw these birds throughout the winter of 1908–9 in a warm willow swamp near Bozeman.

38. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Recorded from Fort Ellis in the summer of 1875 by Mr. George Bird Grinnell.

39. **Pisobia minutilla.** LEAST SANDPIPER.— Recorded with the above species from Fort Ellis by Mr. Grinnell.

40. **Totanus melanoleucus.** GREATER YELLOW-LEGS.— Richmond and Knowlton recorded this species as common in September.

41. **Totanus flavipes.** YELLOW-LEGS.— Recorded from Fort Ellis in 1875 by Mr. Grinnell.

42. **Helodromas solitarius cinnamomeus.** WESTERN SOLITARY SANDPIPER.— Common migrant in August. I have not noted it in spring.

43. **Catoptrophorus semipalmatus inornatus.** WESTERN WILLET. — A pair noted by Richmond and Knowlton at Moreland, now known as Manhattan, Aug. 19, 1888.

44. **Bartramia longicauda.** UPLAND PLOVER.— Rather rare summer resident. I noted this species near Sedan July 30, 1908, and in the Gallatin Valley, north of Bozeman, July 22, 1909. In the latter case the bird evidently had young near.

45. **Actitis macularia.** SPOTTED SANDPIPER.— Common summer resident. Breeds both in the valleys and along mountain streams to at least 7500 feet. This species arrives about the middle of May and leaves in August or early September.

46. **Numenius americanus.** LONG-BILLED CURLEW.— Summer resident. Breeds abundantly in the Three Forks Valley but occurs rarely and only in migrations in the Gallatin Valley.

47. **Oxyechus vociferus.** KILLDEER.— Common summer resident in the valleys. Prefers cultivated lands about plowed fields and irrigating ditches.

48. **Podasocys montanus.** MOUNTAIN PLOVER.— Mr. Thomas noted this species at Three Forks in June, 1909 when it was evidently breeding.

*49. **Dendragapus obscurus obscurus.** DUSKY GROUSE.

*50. **Dendragapus obscurus richardsoni.** RICHARDSON'S GROUSE. — Gallatin County lies where the range of these two forms meet. Most of the birds are intergrades and not typical of either form. I believe that the larger part of the Gallatin County birds are nearer *obscurus* than *richardsoni*, while further north and west in Montana the reverse is true.

*51. **Bonasa umbellus togata.** CANADA RUFFED GROUSE.— Permanent resident. Abundant in the foothills and in willow and spruce swamps high into the mountains.

*52. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Resident in the valleys. Richmond and Knowlton found it very common. It is seldom seen now in the Gallatin Valley but occurs in fair numbers in the Three Forks and East Flathead Valleys. A specimen taken near Sedan was considered nearer to this form than to *columbianus* by Dr. Bishop.

53. **Centrocercus urophasianus.** SAGE GROUSE.— Richmond and Knowlton found this species common in the valleys. To-day it occurs, to my knowledge, only in the East Flathead Valley.

54. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Abundant summer resident in the valleys. This bird appears about May 10 and leaves in September. It nests commonly in willow thickets and on the ground in sagebrush land.

55. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Rare summer resident. Seen a few times from April to September. Richmond and Knowlton found it common but it does not appear to be so now.

56. **Circus hudsonius.** MARSH HAWK.— Abundant summer resident in the valleys. The males arrive in the latter part of March and the females a week or two later. They usually breed in willow thickets. In August and September they are very abundant in the Gallatin Valley and leave early in October. I believe this species will be found to be of considerable value to the farmers of the Gallatin Valley because of its destruction of gophers and other small rodents.

57. **Accipiter velox.** SHARP-SHINNED HAWK.— Summer resident in the mountains but much more abundant in the valleys and foothills during migrations. I noted them commonly from Sept. 15 to Oct. 6, 1908, and from May 13–29, 1909.

58. **Accipiter cooperi.** COOPER'S HAWK.— Summer resident in the mountains. I noted this species but twice in the West Gallatin Cañon in July.

*59. **Astur atricapillus.** GOSHAWK.— Rare summer resident in the mountains where Mr. Ginn, a taxidermist in Bozeman, found a nest on Spanish Creek. Common fall migrant and occasional throughout the winter in both valleys and mountains.

*60. **Buteo borealis calurus.** WESTERN RED-TAIL.— Common summer resident, breeding in tall firs in the mountains and foothills. It arrives about the first of April and leaves in the middle of October.

61. **Buteo swainsoni.** SWAINSON'S HAWK.— Summer resident in the valleys, nesting in cottonwood groves. This species appears to be much commoner at lower elevations in the northern part of the county.

62. **Archibuteo lagopus sancti-johannis.**— ROUGH-LEGGED HAWK. — Common winter resident in the valleys. This is the only abundant winter hawk. It appears about Oct. 10 and remains until the middle of April. It feeds largely on gophers and will probably prove to be of value for this reason.

63. **Archibuteo ferrugineous.** FERRUGINOUS ROUGH-LEG.— Summer resident. Not common in the Gallatin Valley but common in the Three Forks and East Flathead Valleys. Mr. Thomas found a nest in a cottonwood grove near Three Forks in June, 1909.

64. **Aquila chrysaëtos.** GOLDEN EAGLE.— Permanent resident. A few pairs breed in the West Gallatin Cañon, and Mr. Thomas found a nest of the species in Bridger Cañon.

65. **Haliæëtus leucocephalus.** BALD EAGLE.— I saw a bird of this species in Middle Creek Cañon Nov. 10, 1908. Mr. Thomas reported another which was captured alive on Maine St., Bozeman, in July, 1909.

66. **Falco mexicanus.** PRAIRIE FALCON.— Summer resident. I have seen this species only at Three Forks but there is a specimen at the Agricultural College which was found dead in the Gallatin Valley near Bozeman.

67. **Falco peregrinus anatum.** DUCK HAWK.— Summer resident. Fairly common from the middle of April until the last of October. Mr. Rheesis Fransham showed me a nest of this species on a limestone cliff on Squaw Creek, in the West Gallatin Cañon.

68. **Falco columbarius richardsoni.** RICHARDSON'S PIGEON HAWK. — Taken on the Madison River by Richmond and Knowlton, Sept. 23, 1888. Mr. Thomas noted this species twice during the summer of 1909 in the mountain cañons south of Bozeman.

*69. **Falco sparverius phalæna.** DESERT SPARROW HAWK.— Abundant summer resident in the valleys and lower mountain cañons. It appears in the latter part of April and leaves in October.

70. **Pandion haliaëtus carolinensis.** OSPREY.— I have seen this species but once, June 13, 1909, near Bozeman. Richmond and Knowlton recorded it as rather common and it is probably more abundant along the larger rivers.

71. **Asio wilsonianus.** LONG-EARED OWL.— Richmond and Knowlton noted this species along the Jefferson River. Mr. Thomas saw some

young birds which some boys had taken from an old crow's nest in a willow thicket near Bozeman.

72. **Asio flammeus.** SHORT-EARED OWL.— Permanent resident in the valleys. This species was particularly abundant in the Gallatin Valley during April, 1909, when it was to be seen on dark days and toward evening, sitting on fence posts along the roads. A farmer in the Gallatin Valley described a nest, evidently of this species, to Mr. Thomas.

73. **Strix varia.** BARRED OWL.— I noted this species in Sour Dough Cañon, Aug. 5, 1909.

74. **Otus asio maxwelliæ.** ROCKY MOUNTAIN SCREECH OWL.— Mr. Thomas heard this species in Bridger Cañon, July 20, 1909.

75. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— Permanent resident in both valleys and mountains.

76. **Nyctea nyctea.** SNOWY OWL.— Seen occasionally in the Gallatin Valley in winter. Said to occur in large numbers some winters.

77. **Glaucidium gnoma.** PYGMY OWL.— Permanent resident in the mountains. I noted this species near Flathead Pass in September, 1908, and in Sour Dough Cañon in January, 1909. Mr. Thomas found a nest containing young in Bridger Cañon in June, 1909.

78. **Ceryle alcyon.** BELTED KINGFISHER.— Common summer resident. This species arrives early in April and leaves in the first part of October. It probably winters occasionally as I noted an individual at Three Forks, Feb. 12, 1910.

79. **Dryobates villosus monticola.** ROCKY MOUNTAIN HAIRY WOODPECKER.— Permanent resident, occurring in the mountains in summer and in cottonwood groves in the valleys in winter. In June, 1909, I located several nests containing young.

80. **Dryobates pubescens homorus.** BATCHELDER'S WOODPECKER. — Permanent resident, occurring in similar places to the above species but much less common.

81. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.— Taken by F. H. Knowlton in the Gallatin Basin, Aug. 29, 1890.

82. **Picoides americanus americanus.** THREE-TOED WOODPECKER.

83. **Picoides americanus dorsalis**. ALPINE THREE-TOED WOODPECKER.— This species is a permanent resident in the mountains. I believe that birds referable to both forms may be found. A male bird in the collection at the Agricultural College, taken in Bear Cañon has very little white on the back while the birds I have observed have so much white that it is difficult to distinguish the female from Batchelder's Woodpecker in the field. In June, 1909, I watched a pair of these birds excavating their nest on Middle Creek. The male bird did most of the work of excavation. This nest was deserted before the eggs were laid.

84. **Sphyrapicus varius nuchalis.** RED-NAPED SAPSUCKER.— A common summer resident in the foothills and mountains breeding in aspen groves. In July, 1909, I found a nest of this species containing young on the West Fork. About two feet below the entrance to this nest was an older hole which was occupied by a family of red squirrels.

85. **Sphyrapicus thyroideus.** WILLIAMSON'S SAPSUCKER.— Taken by F. H. Knowlton in the Gallatin Basin. Thomas found a nest of this species in Bridger Cañon.

86. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— A male of this species, taken in the mountains south of Bozeman, is in the collection at the Agricultural College.

87. **Asyndesmus lewisi.**— LEWIS'S WOODPECKER.— Common summer resident in the foothills and valleys arriving early in May. I found two nests of this species in dead cottonwoods near Salesville.

88. **Colaptes auratus luteus.** NORTHERN FLICKER.

89. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— Birds referable to both of these species occurs but the large majority of birds are hybrids. They arrive early in April and leave about November 1. A few winter in the vicinity of Lombard.

90. **Phalænoptila nuttalli.** POOR-WILL.— I found this species in the foothills near Lyman Creek July 20 and 21, 1909, and secured a specimen on July 21.

91. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.— Abundant summer resident, arriving about the second week in June and leaving late in August. During July, 1909, I found young on several occasions in sagebrush land.

92. **Selasphorus rufus.** RUFOUS HUMMINGBIRD.— Summer resident. Mr. Rheesis Fransham showed me a nest of this speies on Squaw Creek.

93. **Stellula calliope.** CALLIOPE HUMMINGBIRD.— An immature bird was taken by F. H. Knowlton, Aug. 12, 1890. An adult male from Squaw Creek is in the collection at the Agricultural College. I have not met this species in Gallatin County but secured an adult male near Cokedale, Park County, on May 29, 1909.

94. **Tyrannus tyrannus.** KINGBIRD.— Common summer resident in the valleys. This bird nests abundantly in the cottonwood trees in Bozeman. It arrives about May 20, and leaves the last of August.

95. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Summer resident in the valleys but less common than the above species. This species arrives about a week later than the common Kingbird and departs somewhat earlier.

96. **Sayornis sayus.** SAY'S PHŒBE.— Two specimens taken by Richmond and Knowlton. I know of no other records of this species. It is probably rare in most parts of the county.

97. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— Summer resident in the mountains. This species is well distributed but not common. It frequents open fir forests and appears to prefer trees that are spike topped and partially dead. It is occasionally seen in the valleys during migrations.

98. **Myiochanes richardsoni.** WESTERN WOOD PEWEE.— Summer

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[1] See The Condor, Vol. XI. pp. 197.

resident in cottonwood groves in the valleys. Very abundant in Bozeman. This species arrives about June 10, and leaves early in September.

99. **Empidonax traillii traillii.** TRAILL'S FLYCATCHER.

*100. **Empidonax traillii alnorum.** ALDER FLYCATCHER.— This species is a rather rare summer resident in willow and alder thickets along mountain streams. I believe that specimens referable to both of the above forms will be found to occur. A specimen taken on Brackett Creek on May 21, 1909, proved rather puzzling as it is almost an exact intergrade, but was finally referred to *alnorum* by Dr. Bishop.

101. **Empidonax minimus.** LEAST FLYCATCHER.— Summer resident in the valleys. So far I have only met this species in the cottonwood trees in Bozeman where it is quite abundant. It appears in the latter part of May and leaves again in August.

102. **Empidonax hammondi.** HAMMOND'S FLYCATCHER.—Summer resident in the mountains, frequenting willow and alder thickets along streams and the edges of mountain parks. I found a nest of this species in Sour Dough Cañon, July 2, 1909.

103. **Empidonax wrighti.** WRIGHT'S FLYCATCHER.— Common summer resident in the foothills, frequenting aspen groves and clumps of young fir. It arrives in the latter part of May.

104. **Otocoris alpestris leucolæma.**— DESERT HORNED LARK.— Abundant summer resident in the Three Forks Valley but only locally common during the breeding season in the Gallatin Valley. This bird prefers grazing land and rolling grassy hills, rather than agricultural districts. This species arrives very early in March and its flocks are usually the first sign of the spring migration. It leaves in late November and a few remain about Three Forks, in company with the next form, throughout the winter.

*105. **Otocoris alpestris arcticola.** PALLID HORNED LARK.— Common winter resident in the valleys, arriving in December and leaving in February or early March.

106. **Pica pica hudsonia.** MAGPIE.— Abundant permanent resident, nesting in willow thickets in the valleys and in thorn-bushes and aspen groves in the foothills. They begin nesting in April or May and the first young are to be seen by the last of May. In the fall they may often be seen in the mountains as high as 8,000 feet.

*107. **Cyanocitta stelleri annectens.** BLACK-HEADED JAY.— Permanent resident in the mountains, being usually more common in fir than in pine forests. In the winter they stay about cabins and lumber camps in company with Rocky Mountain Jays and Nutcrackers. In October I have occasionally seen them in the valleys in willow thickets.

*108. **Perisoreus canadensis capitalis.** ROCKY MOUNTAIN JAY.— Permanent resident in the mountains, and seen most commonly about lumber camps and cabins when they are quite tame.

109. **Corvus corax sinuatus.** WESTERN RAVEN.— I saw a raven about Ramshorn Peak in the Gallatin Range at an elevation of 9,000 feet on Oct. 29, 1908.

*110. **Corvus brachyrhynchos hesperis.** Western Crow.— Common summer resident, nesting in willow thickets in the valleys. Richmond and Knowlton noted a crow roost in the mountains south of Fort Ellis. So far as I know, this roost does not exist at present, perhaps because a large amount of timber has been removed from this vicinity since then. Crows are among the earliest migrants, arriving in late March and leaving in October. A few remain in the vicinity of Bozeman throughout the winter.

111. **Nucifraga columbiana.** Clark's Nutcracker.— Permanent resident in the mountains, occurring most commonly in the alpine forests but not uncommon as low as 6,000 feet in open stands of Douglas fir. Mr. A. M. Pyfer found this species nesting near Salesville in March.

112. **Dolichonyx oryzivorus.** Bobolink.— Common summer resident in the valleys. Richmond and Knowlton found it in but one place in the Gallatin Valley, which shows a recent increase in the species, since it is now found in many places throughout this valley. It arrives about the middle of May and leaves in late August.

113. **Molothrus ater.** Cowbird.— Common summer resident, arriving in the second week in May. I have found their eggs more often in the nest of Brewer's Blackbird than any other species. Mr. Thomas found the eggs and young quite commonly in the nest of the Slate-colored Sparrow.

114. **Xanthocephalus xanthocephalus.** Yellow-headed Blackbird.— Common summer resident about Three Forks but, so far as I know, not found in the Gallatin Valley, probably because of the lack of suitable breeding grounds.

*115. **Agelaius phœniceus fortis.** Thick-billed Red-wing.— Summer resident, but not common because of the lack of suitable localities. A small colony nests just south of Bozeman and another in the East Flathead Valley, the latter in willow bushes with a company of Brewer's Blackbirds. This species arrives in April and leaves in October or later. I secured two birds on Dec. 9, 1908, in the East Flathead Valley about on the border line of Park and Gallatin counties.

116. **Sturnella neglecta.** Western Meadowlark.— Abundant summer resident in the valleys. This species appears about the middle of March and leaves in November. A few spend the winter in the grainfields of the Gallatin Valley.

117. **Icterus bullocki.** Bullock's Oriole.— Rare summer resident. Mr. Thomas saw one of these birds in Bozeman in August, 1909. There is an adult female, taken in the Gallatin Valley, in the collection at the Agricultural College. It will perhaps be found to be more common along the upper Missouri as I noted several old nests at Lombard in February, 1910.

118. **Euphagus cyanocephalus.** Brewer's Blackbird.— Common summer resident in the valleys, nesting in colonies in the willow thickets and wild-rose bushes. They arrive in April and leave in October. A large percentage of their nests contains Cowbird's eggs.

119. **Quiscalus quiscula æneus.** BRONZED GRACKLE.— Rare summer resident. There is a mounted specimen of this bird in the collection at the Agricultural College which was taken on the college grounds in Bozeman. Mr. Thomas found a pair evidently nesting in a willow thicket near Bozeman, and Mr. Wyatt Jones told me that they were fairly common in the vicinity of Belgrade.

*120. **Hesperiphona vespertina montana.** WESTERN EVENING GROSBEAK.— Regular migrant. Flocks of these birds may be seen in cottonwood groves and willow thickets in spring and fall. They appear in March and are common until April 10. I saw a single male as late as May 8, 1909. The fall migration occurs in October and November, when they are sometimes seen in Bozeman feeding on Box Elder seeds.

*121. **Pinicola enucleator montana.** ROCKY MOUNTAIN GROSBEAK.— Summer resident in the higher mountains and migrant in the valleys. It appears in the valleys about the middle of October and is fairly abundant in the willow thickets for a time. It is most abundant in spring in April and a few remain until early May. A few may winter but I believe that most if not all of the winter birds belong to the next form. The type specimens, from which this form was first described by Ridgway, came from this region.

*122. **Pinicola enucleator alascensis.** ALASKAN PINE GROSBEAK.— Two birds taken Dec. 21, 1908, were referred to this form by Dr. Bishop. I have noticed a break in the abundance of Pine Grosbeaks in the first part of November and the last part of March which leads me to believe that this is the common winter form and that this break occurs when the summer form is leaving and the winter birds have not yet arrived and *visa-versa.*

123. **Carpodacus cassini.** CASSIN'S PURPLE FINCH.— Summer resident, arriving early in May and breeding in the fir forests in the mountains and occasionally in cottonwood groves in the valleys. It is not uncommon in Bozeman throughout the breeding season.

124. **Loxia curvirostra minor.** CROSSBILL.— Migrant in the mountains. I saw flocks of this species from Sept. 23 to Oct. 24, 1908, and on May 19, 1909. I have not noted it during the breeding season.

*125. **Leucosticte tephrocotis.** GRAY-CROWNED ROSY FINCH.— Migrant and winter resident. This bird appears to be very irregular in its occurrence. I noted it in the Gallatin Mountains in October. During the winter it was usually quite rare but became very common in the Gallatin Valley for a short time during April and early May. Though seldom seen in this region, when it is observed it is always in large flocks.

*126. **Leucosticte tephrocotis littoralis.** HEPBURN'S ROSY FINCH. — I found several Gallatin County specimens of this form in the collection at the Agricultural College. It undoubtedly occurs with flocks of the above form.

127. **Acanthis linaria.** REDPOLL.— Abundant winter resident. This bird first appears in September, becomes quite common by the middle

of October and in winter is probably the most abundant of all species. In spring I noted it in small numbers up to May 20, 1909.

*128. **Astragalinus tristis.** GOLDFINCH.— Common summer resident in willow thickets in the valleys. It occasionally winters in small flocks. A bird secured at Three Forks in February, 1910, was identified as *A. t. tristis* by Dr. Bishop although *A. t. pallidus* should occur and perhaps will be found to be the common breeding form in this region.

129. **Spinus pinus.** PINE SISKIN.— Abundant summer resident. This species arrives in May and breeds in cottonwood groves in the valleys and lower mountain cañons and in the mountain forests as high as 8,000 feet. I found a nest of this species in middle Creek Cañon placed in a willow three feet from the ground. This nest was partially completed on June 21, and contained three eggs by June 26. Mr. Thomas found several nests in cottonwood trees and young firs in Bozeman. One of these contained four fully fledged young on Aug. 20, 1909. This species leaves in the middle of September.

130. **Passer domesticus.** ENGLISH SPARROW.— This bird is now quite common in all towns and settlements along the railroads. It arrived some time in the last ten years but I have been unable to get exact data.

131. **Plectrophenax nivalis.** SNOW BUNTING.— Mentioned as occurring in winter at Salesville, by Mr. A. M. Pyfer.

132. **Calcarius lapponicus.** LAPLAND LONGSPUR.— I noticed large flocks of this species on March 30 and April 1 and 17, 1909. It probably occurs regularly in migrations and perhaps in winter.

133. **Poœcetes gramineus confinis.** WESTERN VESPER SPARROW.— Common summer resident. This species arrives late in April and leaves the last of September. It is a very common bird in the cultivated parts of the Gallatin Valley and even commoner in the sagebrush land of the East Flathead Valley. I found young of this species out of the nest and barely able to fly on July 22, and probably a second brood nest, containing fresh eggs on July 27.

*134. **Passerculus sandwichensis alaudinus.** WESTERN SAVANNAH SPARROW.— Common summer resident in the valleys, arriving about the middle of May.

135. **Ammodramus savannarum bimaculatus.** WESTERN GRASSHOPPER SPARROW.— Summer resident in the valleys. Quite rare in the Gallatin Valley but fairly common about Three Forks.

*136. **Chondestes grammacus strigatus.** WESTERN LARK SPARROW. — Richmond and Knowlton obtained specimens of this bird. I have observed it but once, on July 7, 1909, in a thicket of tall sage-brush and greasewood near Lombard.

137. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.— Common summer resident. This species breeds in willow thickets, both in the valleys about Bozeman and in the mountain cañons up to 8,000 feet. It arrives early in May, in company with the next form, and leaves about

the middle of October. Mr. Thomas found a nest of this species near Bozeman in June and I discovered one on June 25 on Middle Creek, at an elevation of 7,100 feet.

*138. **Zonotrichia leucophrys gambeli.** INTERMEDIATE SPARROW.— Abundant migrant in May and in September and October. Richmond and Knowlton stated that this form breeds in the mountains. They did not state that any summer birds were taken, and since they did not record the above form, I believe they must have mistaken it for this one. I have never taken the form *leucophrys*, but have examined many birds closely in the field and have never found *gambeli* in either valleys or mountains in summer. At the Middle Creek nest mentioned above I was able to examine the sitting female from a few feet distance and feel certain of her identity.

*139. **Spizella monticola ochracea.** WESTERN TREE SPARROW.— Common winter resident in the valleys, particularly in willow thickets. It arrives late in September and leaves late in April.

140. **Spizella passerina arizonæ.** WESTERN CHIPPING SPARROW.— Common summer resident. This species occurs in the valleys in cottonwood groves and in the mountains, about the edges of mountain parks, as high as 8,000 feet. It is quite common in Bozeman and arrives about the middle of May and leaves in September.

141. **Spizella breweri.** BREWER'S SPARROW.— Richmond and Knowlton found this species commonly. I noted it but once, in the East Flathead Valley on July 28, 1909, when I saw both adults and a young bird just out of the nest.

*142. **Junco hyemalis.** SLATE-COLORED JUNCO.— Abundant migrant from the middle of September till November and from the middle of April to the middle of May. I estimated that about 10 to 20 % of the flocks of migrant Juncos were of this form.

*143. **Junco hyemalis shufeldti.** SHUFELDT'S JUNCO.— Abundant migrant. This is usually the first Junco to arrive in spring, appearing about April 1 and remaining till early in May. It is also later than the other subspecies in fall, occurring from early October to the middle of November. It usually forms 30 to 40 % of the migrant flocks but occasionally flocks are almost entirely of this form.

*144. **Junco hyemalis montanus.** MONTANA JUNCO.— A regular migrant in flocks with the other Juncos. Since it is more difficult to distinguish in the field than the other forms I have few notes as to its relative abundance.

*145. **Junco hyemalis mearnsi.** PINK-SIDED JUNCO.— Common summer resident in the mountains and usually the most abundant of the migrant Juncos, forming from 50 to 100 % of the flocks. This form arrives in April and leaves in late October. In summer it occurs from 6,000 to 8,000 feet in open woods and about the edges of mountain parks. I found a nest in the Bridger Mountains, containing partially incubated eggs, on July 19, 1908.

146. **Amphispiza nevadensis.** SAGE SPARROW.— An abundant summer resident in the East Flathead Valley. The only other place that I have found it is in the Gallatin Basin where I heard several birds singing in July.

*147. **Melospiza melodia montana.** MOUNTAIN SONG SPARROW.— Abundant summer resident in willow thickets in the valleys and along mountain streams to at least 7,500 feet. It is also quite a common winter resident as high as 6,500 feet. The spring song period begins very early so that it is impossible to distinguish migrants from winter residents with certainty. The spring migrants, however, evidently arrive by April 1, if not sooner.

148. **Melospiza lincolni.** LINCOLN'S SPARROW.— An abundant summer resident in willow thickets in the mountains, above 6,500 feet. It arrives early in June, occurring in the valleys, in small numbers, for a few days. The fall migration apparently begins early, for I have found it in the valleys again by July 30. It remains until early September.

*149. **Passerella iliaca schistacea.** SLATE-COLORED FOX SPARROW.— Abundant summer resident in willow thickets in the valleys, arriving early in April. It prefers the thickest and most impenetrable of the willow thickets. For this reason it is more often heard than seen, and I have no records of its occurrence after July 10, when the song period ceases.

150. **Pipilo maculatus arcticus.** ARCTIC TOWHEE.— Abundant summer resident in thickets of willow, wild-rose and thorn in the valleys and foothills. It arrives in the middle of May and leaves by the middle of September.

151. **Oreospiza chlorura.** GREEN-TAILED TOWHEE.— Summer resident in the foothills in wild-rose and thorn thickets. It arrives in the latter part of May. It is much less common than the above species, though usually found in company with it.

152. **Zamelodia ludoviciana.** ROSE-BREASTED GROSBEAK.— Mr. Thomas observed a male of this species on Church St., Bozeman, on two different occasions in June and July, 1909. On the first occasion it was in company with a male of the next species.

153. **Zamelodia melanocephala.** BLACK-HEADED GROSBEAK.— Summer resident in the valleys, inhabiting the willow thickets. I have not seen this species in the East Flathead Valley nor in the other valleys above 5,000 feet. It arrives late in May.

154. **Passerina amœna.** LAZULI BUNTING.— Common summer resident, inhabiting wild-rose thickets in the valleys and foothills. Arrives in the latter part of May and leaves in August.

155. **Calamospiza melanocorys.** LARK BUNTING.— Summer resident. I noted only a few individuals of this species during the spring migration from May 24 to June 13, 1909. Mr. Thomas found it breeding commonly at Three Forks and Prof. Cooley told me that in 1907 it appeared in large numbers and bred throughout the Gallatin Valley, but that he had not seen it since then.

156. **Piranga ludoviciana.** WESTERN TANAGER.— Summer resident in the mountains, appearing to have a decided preference for fir forests, as I have only noted it in this type. It arrives early in June and occurs for a short time in cottonwood groves in the valleys. I have not noted it later than Aug. 3.

157. **Progne subis.** PURPLE MARTIN.— Both Mr. Thomas and I noted this species in Bozeman during June and July. I believe that they were breeding somewhere in the northwestern quarter of the town, but we were unable to locate the spot.

158. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Common summer resident. Very abundant in the Gallatin Valley, nesting under the eaves of buildings. A few large colonies breed on cliffs along the Missouri and Gallatin Rivers near Logan and Lombard. Arrives early in June and leaves in August.

159. **Hirundo erythrogastra.** BARN SWALLOW.— Common summer resident. Abundant in the Gallatin Valley, where I found it breeding under low bridges over irrigating ditches about as commonly as in barns. This species arrives in the latter part of May and leaves late in August.

160. **Iridoprocne bicolor.** TREE SWALLOW.— Summer resident, but more common in migrations. Richmond and Knowlton found a colony breeding in a clump of cottonwood trees. I have noted it in the breeding season but once, when a single pair had a nest in a building in the busiest part of Main St., Bozeman. The birds were not there in 1909 and the site was occupied by English Sparrows. This species arrives early in May and leaves in September.

161. **Tachycineta thalassina lepida.** NORTHERN VIOLET-GREEN SWALLOW.— Common summer resident, breeding in limestone cliffs in the lower mountain cañons, below 6,000 feet. Colonies occur in the cañons of Sixteen Mile and Bridger Creeks and the Gallatin River. This species arrives about the middle of May and leaves late in August.

162. **Riparia riparia.** BANK SWALLOW.— Summer resident, but not common. There are breeding colonies in banks along the East Gallatin River and Bridger Creek.

163. **Stelgidopteryx serripennis.** ROUGH-WINGED SWALLOW.— Common summer resident. This species breeds commonly throughout the valleys, usually with but a single pair in a locality. They arrive about May 20 and leave late in August.

164. **Bombycilla garrula.** BOHEMIAN WAXWING.— Common winter resident. This species arrives in the mountains in the last of October and is seen in the valleys a few weeks later. Flocks occur all winter both in valleys and in the mountains as high as 7,000 feet. In midwinter they often visit Bozeman in large numbers and strip the mountain ash trees of their berries. In the mountains they feed on cedar, juniper and bearberry. They leave in spring about the last of April.

165. **Bombycilla cedrorum.** CEDAR WAXWING.— Summer resident. This species arrives later than most others, being noted first on

June 18, 1909. I saw it but once in 1908, but it was very common in 1909, when I found two nests in the shade trees of Bozeman in August. I believe that this difference in abundance was due to the relative abundance of service-berries, which form a large portion of the food of the young.

166. **Lanius borealis.** NORTHERN SHRIKE.— Common winter resident in the valleys. This species arrives early in October and leaves by the last of March. I have seen it in mountain parks as high as 7,000 feet in November. An adult male, taken at Three Forks in February, 1910, had the typical measurements and markings of the form described as *L. b. invictus*. Should this form be accepted as a subspecies it should be included in the list of Gallatin County birds.

167. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE. — Summer resident. Richmond and Knowlton recorded it as common in the valleys. I have not seen it in summer but noted it quite commonly from May 2–15, 1909.

168. **Vireosylva olivacea.** RED-EYED VIREO.— Summer resident in cottonwood groves in the valleys. Not common. I have noted it near Logan and on a small island in the Gallatin River near Salesville. During migrations in late August I have occasionally seen it in Bozeman.

169. **Vireosylva gilva swainsoni.** WESTERN WARBLING VIREO.— Common summer resident in cottonwood groves in the valleys and about the edges of mountain parks to 7,500 feet. It arrives in the latter part of May and leaves late in August. It is quite common in the shade trees of Bozeman, where it builds beautiful nests, using cottonwood down largely in the construction.

170. **Vermivora celata lutescens.** LUTESCENT WARBLER.— Migrant. This bird was quite common in the valleys and foothills from May 8 to June 2, 1909.

171. **Dendroica æstiva.** YELLOW WARBLER.— Common summer resident in willow thickets in the valleys. This species arrives about May 20 and leaves late in August.

172. **Dendroica auduboni.** AUDUBON'S WARBLER.— Common summer resident in the mountains. This species is abundant in the foothills during migrations. It first appears early in May and leaves about the middle of October.

173. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH.— Summer resident. Not common. A few of these birds may be found throughout the summer in the willow swamps near Bozeman. They arrive about the end of May.

174. **Oporornis tolmiei.** MACGILLIVRAY'S WARBLER.— Common summer resident in willow and wild-rose thickets in the valleys and foothills. It arrives late in May.

175. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT. — Common summer resident in similar places to the above species but somewhat more abundant. Arrives about May 20.

176. **Wilsonia pusilla pileolata.** PILEOLATED WARBLER.— Common

summer resident in willow thickets in the mountains above 7,000 feet. This species arrives early in June and departs in September. During migrations it is quite abundant for a short time in the valleys.

177. **Setophaga ruticilla.** REDSTART.— Summer resident in cottonwoods, willows and alders in the valleys and in the lower mountain cañons. It arrives late in May and is not common.

178. **Anthus rubescens.** PIPIT.— Common fall migrant, appearing in the valleys about the middle of September and remaining until the latter part of October. It is often in company with Horned Larks. I have not seen this species in spring.

179. **Cinclus mexicanus unicolor.** DIPPER.— Permanent resident in the mountain cañons. In winter I have occasionally seen these birds near Bozeman on Bozeman Creek and the East Gallatin River, but only in places where the water runs swiftly. Most of them remain in the mountain cañons all winter where they sing better and more frequently in February and March than at any other time of year. In 1909 I found four nests of this species placed on beams of bridges, and this seems to be a very common location for them in this region. Out of eight nests found, only one was placed in the traditional location, beside a waterfall where the spray kept the moss fresh. The rest were on bridges, on rocks above the water, and one in the beams of a splash dam. In the latter case the dam was in use when the birds were building and was opened and closed twice a day so that the water sometimes flowed over the top and sometimes through at the bottom. The birds attempted to build as close to the water as possible and thus had two locations for their nest. The water, however, kept removing the material from the lower site so that the upper nest was finally completed and occupied.

180. **Oreoscoptes montanus.** SAGE THRASHER.— I found this bird in the East Flathead Valley on June 8, 1909. Richmond and Knowlton noted it in the Gallatin Valley and secured a specimen. Like the other sagebrush species it has probably entirely disappeared from the Gallatin Valley since then.

181. **Dumetella carolinensis.** CATBIRD.— Common summer resident in the willow thickets in the valleys. It arrives late in May and leaves about the 10th of September.

182. **Salpinctes obsoletus.** ROCK WREN.— Summer resident. This bird is quite common in the limestone rocks of the northern part of the county, occurring along the Missouri River and on Sixteen Mile Creek and its branches. I have not found it in other parts of the county. I believe that the reason for this is the character of the country rather than the elevation, because it occurs at much higher elevations in neighboring counties.

183. **Troglodytes aëdon parkmani.** WESTERN HOUSE WREN.— Summer resident but not common. This species arrives about May 20 and nests about buildings in the valleys.

184. **Cistothorus stellaris.** SHORT-BILLED MARSH WREN.— I ob-

served a bird of this species in a clump of tall grass along the Missouri River at Lombard on April 22, 1909.

*185. **Certhia familiaris montana.** ROCKY MOUNTAIN CREEPER.— A rare summer resident in spruce forests in the mountains. Seen more often during migrations but by no means common then. The migrating birds were noted from Sept. 11 to Nov. 10, 1908, and from March 25 to April 16, 1909. I observed it once in winter near Ross's Peak, Feb. 17, 1909.

186. **Sitta carolinensis nelsoni.** ROCKY MOUNTAIN NUTHATCH.— Rare but probably permanent resident. Richmond and Knowlton found it breeding. I noted it but twice, Sept. 28, 1908, and Feb. 27, 1909.

187. **Sitta canadensis.** RED-BREASTED NUTHATCH.— Migrant. Quite common in fall. Noted from Sept. 7 to Oct. 24, 1908, and from April 16 to May 25, 1909.

*188. **Penthestes atricapillus.** CHICKADEE.— A Chickadee, taken at Bozeman, Nov. 26, 1908, was identified as *P. a. atricapillus* by Dr. Bishop. This bird had the breast stained dark gray, a common occurrence among winter Chickadees in this region and said to be caused by living in burned timber. Since there are no large bodies of burned timber in this region it is apparent that they migrate from elsewhere. Thinking that all the dark-breasted birds might belong to this form I secured another at Three Forks in February, 1910. This bird, however, proved to be the usual form, *P. a. septentrionalis.*

*189. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— Abundant permanent resident in willow thickets in the valleys and mountain cañons to about 6,500 feet.

190. **Penthestes gambeli.** MOUNTAIN CHICKADEE.— Permanent resident in the mountains. In October it may be seen occasionally in the valleys with the above species.

*191. **Regulus satrapa olivaceus.** WESTERN GOLDEN-CROWNED KINGLET.— Abundant migrant and rather uncommon summer resident in spruce forests in the mountains. Occasional as a winter resident in company with Mountain Chickadees.

192. **Regulus calendula.** RUBY-CROWNED KINGLET.— Common summer resident in the mountains. In migrations this species occurs in willows in the valleys but in the breeding season is found only in forests of Douglas fir. The song of this species in this region is quite different from that of eastern Kinglets. The first two parts are much alike but in the last part, in place of the triplets of the eastern bird, there are a series of double notes on the same pitch, the first note of each double accented. When only the last part of the song is rendered, as is frequently the case, it closely resembles a common call of the Tufted Titmouse.

193. **Myadestes townsendi.** TOWNSEND'S SOLITAIRE.— Summer resident in the mountains but more common during migrations. It does not breed below 7,000 feet to my knowledge, but during migrations is common in the foothills and lower forests. It appears to sing better and more

frequently during the fall than at any other time. It winters rarely in the mountains and quite commonly among the rocky cliffs about Lombard.

194. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.— Common summer resident in willow thickets in the valleys. It arrives late in May and leaves in August.

*195. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— Common summer resident in the mountains, arriving about June 1 and leaving early in September. Occurs regularly in the valleys during migrations.

196. **Hylocichla guttata auduboni.** AUDUBON'S HERMIT THRUSH. — Summer resident in the mountains. Quite rare and usually above 7,000 feet.

*197. **Planesticus migratoria propinqua.** WESTERN ROBIN.— Common summer resident, occurring in valleys and mountains up to 8,000 feet. This species arrives in the middle of March and leaves late in October. It winters rarely. I observed one at Three Forks, Feb. 12, 1910.

198. **Sialia currucoides.** MOUNTAIN BLUEBIRD.— Common summer resident in the valleys and lower mountain peaks below 6,500 feet. This species arrives early in March and leaves in November.

THE PASSENGER PIGEON INVESTIGATION.[1]

BY C. F. HODGE.

AT THE meeting of this Union a year ago a plan was projected and has since been developed to secure adequate search of the American continent for this lost species. If any consider this a "fool's errand," I may add that at that time I put the question fairly to the Union as a body and to a number of you personally: "Do you think that scientifically adequate search has been made for *Ectopistes migratorius*?" Not a decisive affirmative answer was offered, and, among others, Dr. C. Hart Merriam replied distinctly that he did not.

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[1] Read at the meeting of the American Ornithologists' Union held in Washington, D. C., Nov. 14-17, 1910.

The plan is familiar to you all, but one or two points in it require restatement and emphasis. Up to that time rewards were in the field, offered, we may be pardoned for supposing, by good men with a healthy dash of Irish blood in their veins, for a freshly killed pigeon to prove that the species was still alive. I pointed out the "bull" to the effect that even a flock of pigeons, flying rapidly over the country as they do, might be wiped out, each observer taking a single bird.

The new plan called for discovery and confidential and exclusive notification of undisturbed nesting pairs or colonies. Just on this point the newspapers have not been as careful as they should in stating that the rewards were offered for "nests." In consequence, of course, nests, fortunately of Mourning Doves, began coming to me by express. If the reporter was a bit more careful and said "*undisturbed nests,*" I received notification of "undisturbed nests" deserted, the birds having reared their young and moved on.

Since the investigation is undertaken solely with the purpose of discovering breeding pigeons *in time* to secure to them absolute protection, no such claim, however meritorious, could be treated as valid. The newspapers have contributed good service to the cause by disseminating notices, but, with three or four notable exceptions, the service might have been far greater, if their reporters had been clear-headed enough to have grasped this essential purpose of the investigation. The investigation is in reality "news" for the American continent — "bad news" if no pigeons can be discovered, "good news" if they are found; and I have endeavored to furnish the papers accurate information as to progress of the search. I must, however, bespeak added care in stating the one essential point that all rewards are offered for information of undisturbed *nesting pairs or colonies* — occupied nestings — of Passenger Pigeons. Not a reward can be paid for anything else.

I also regret to add that some confusion, delay, and possible annoyance has been caused by many papers failing to state to whom information is to be sent. In this way the editor of 'The Auk,' members of the Smithsonian Institution and Department of Agriculture have been caused additional correspondence. I wish to thank all who have helped thus far and to say that I hope no such confusion will be permitted to occur in future. With such large money prizes involved, it is necessary that one person assume all ultimate responsibility.

It was, of course, expected a year ago that one season's search would settle the matter definitely one way or the other. However, negative evidence is proverbially inconclusive. I have to show you two nests — I might have brought many more — of the Mourning Dove and one nest of probably a Sharp-shinned or Pigeon Hawk, some Mourning Dove feathers and wings, but not a nest or even a feather of the long lost *Ectopistes migratorius*. Not an award has been successfully claimed. What is the reason or sense in prolonging the misery?

In the first place I find myself in the position of the man who was holding the bear. He could not let go. No time limit has been set in any of our announcements so that, in order to keep faith with the public, we must let the awards stand for at least one more season. With a full year's notice, it may be advisable to print in our next announcement that the investigation is to close definitely on October 1, 1911, and that all offers of rewards not claimed by that date will be called off. With the general stirring up the matter has had this year, the observations of another season ought to settle the case for all time.

Although we have no tangible evidence to show, the testimony for the season is greater in amount than for any one year since 1900. After sorting out the season's correspondence I have as possibly true for pigeons seen during 1909 and 1910 reports as follows: From Ontario, 10; from Pennsylvania, 9; from Massachusetts, 8; from New York, 4; from Michigan, 3; from Iowa, 2; and from Illinois, Nebraska, Wisconsin, Minnesota, Connecticut, New Hampshire and Manitoba, 1 each. As a last hope it was thought that these reports might be made to support one another by indicating, when plotted on a map, a consistent course of one or more flocks of pigeons migrating over the continent. So few of these reports, however, give definite data as to number in flock or direction of flight that even this slight hope finds little or no support. The absence of any definite word from reputable naturalists or ornithologists, American or Canadian, is another extremely discouraging and ominous feature of this season's investigation.

Thus what on the surface appear to be the most encouraging reports, in which flocks of hundreds or even thousands of the pigeons have been seen, forfeit all credence on account of their isolation. If, as one report states, the pigeons were nesting in "almost countless numbers" — somewhere in northern United States or Canada (I do not wish to know where until informant is able to report occupied nestings) during the present season, it seems utterly incredible that, in flying to or from their roost, either in feeding or in migrations, they should not have been seen by many others. Another discouraging feature of this year's work is the total absence of reports from the Southern States. If flocks of pigeons are in existence, they ought to be most easily and frequently observed in their southern winter range. Except for unlikely reports from the mountains of western Texas, the Southland has been one vast silence the entire season.

It now looks as if the worst fears of American naturalists were about to be confirmed and that we are "in at the death" of the finest race of pigeons the world has produced.

In the campaign of next season it is proposed to appeal especially to the students and school children, college and university, high school and public school, of this country and Canada, making it thus distinctively educational. Then the awakening to the problem, the bird study necessary to enable one to identify pigeons, if discovered, the wholesome field work will each be worth vastly more to the country at large than the mere cost of this investigation, even if no pigeons are discovered. A number of other valuable species demand united and effective protection, if they are to be saved from extermination.

My own personal expense for postage, printing, office supplies and stationary and for trips to investigate claims has been a little over $100. I said a year ago that I would willingly give this amount to see a live Wild Pigeon or even to be practically assured that the species is extinct. I am willing to renew this sacrifice for one more season. The only other men who have been put to serious expense in this work are Charles K. and Chester A. Reed of Worcester, who have spent $400 on the colored plate and leaflet which has been widely circulated. My grateful acknowledgments are also due to Mr. Dutcher and the National Association of Audubon Societies for preparation of the colored plates of the Passenger Pigeon and Mourning Dove. It is to be hoped that renewed effort for another year may result in what may be generally considered an adequate search of the continent for *Ectopistes migratorius.*

CLARK UNIVERSITY, WORCESTER, MASS.

A DESCRIPTION OF THE WILD PIGEONS WHICH VISIT THE SOUTHERN ENGLISH COLONIES IN NORTH AMERICA, DURING CERTAIN YEARS, IN INCREDIBLE MULTITUDES.

BY PEHR KALM.[1]

Translated by S. M. Gronberger.

IN North America there is a species of wild Pigeons which, coming from the upper part of the country, visits Pennsylvania and others of the Southern English settlements during some years, and in marvelous multitudes.

They have, however, already been described and exceedingly well illustrated in lively colors by the two great ornithologists and matchless masters of bird-drawing, Catesby and Edwards; but as I have had occasion to notice with regard to the description proper and especially as regards the living habits of these Pigeons various things which these gentlemen have either left entirely unmentioned, or which at their places of residence they have not been able properly to ascertain, it is my desire to deliver a short account of this subject before the Royal Academy of Sciences, using the notes from my American Diary.

The *names* given by ornithologists to these Pigeons are as follows:

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[1] Translated from Kongl. Vetenskaps-Akademiens Handlingar, för ar 1759, Vol. XX. Stockholm, 1759.

See also explanatory comment by Dr. Theodore Gill respecting this account of the Passenger Pigeon by Kalm, under 'General Notes' (*postea* p. 110).— EDD.

Columba (*macroura*) cauda cuneiformi longa, pectore purpurascente. Linn. Syst. X, T. I, p. 164.

Columba macroura. The long-tailed Dove. Edwards' *History of Birds*, T. I, p. 15, t. 15.

Palumbus migratorius. The Pigeon of Passage. Catesby's *Nat. Hist. of Carolina*, Vol. I, p. 23, t. 23.

Dufvor, Villa Dufvor [Pigeons, Wild Pigeons], so called by the Swedes in New Sweden.

Pigeons, Wild Pigeons, by the English in North America.

Tourtes, by the French in Canada.

Although these Pigeons have been splendidly illustrated by the above mentioned gentlemen, they have not been able to reproduce their beautiful colors in true accordance with nature, in one respect, at least: the color indicated on either side of the neck should extend much higher up.

Before going further, I shall here give a sufficiently adequate description, first of the male and then of the female, because they are in several respects of a different coloration: in doing this I am using only Latin terms, as these are better understood by ornithologists.

MAS.

Rostrum pro Avis magnitudine tenue, nigrum, aliquantulum aduncum; maxilla superior extra inferiorem prominens, eamque excipiens. Longitudo rostri nudi 5 lin. Geom. Sveth.

Nares semitectae tuberculo oblongo, subcorneo, impressioni digitorum cedenti.

Oculorum Iris coccinea.

Lingua integra, acuta.

Caput totum cinereum in caerulescens vergens; frons tamen sordidius, gula vero vividius cinerea. *Collum* superne cinereum splendens. Ad latera colli, & exinde versus nucham, coloris est cupri splendidissimi in purpureum vergentis, qui in ipsa nucha aliquantulum in viridem mutatur pro diversa versus lucem versura.

Dorsi regio interscapularis cinerascens in pallide fuscum vergens; dorsum inferius dilute glaucum.

Remiges primariae 10, quarum secunda ceteris longior, tum prima, tertia; ceterae ordine breviores. Remiges omnes nigræ quidem, sed diverso modo; nam prima & secunda totæ nigræ; 3–8 nigræ, sed margine exteriore rufescentes, apice albo albescentes; 7, 8, 9, 10 etiam versus interiorem partem albescentes. Remiges secundariæ nigræ, apice albescentes. Tectrices remigum primariarum nigræ, secundariarum proximæ cinereo-glaucæ, remotiores dilute fuscæ maculis quibusdam nigris. Tectrices inferiores alarum dilutissimæ cinereæ.

Cauda complicata longitudine corporis, angusta, Rectricibus 12 diversæ longitudinis; Rectrices duæ supremæ reliquas tegentes nigræ, ceterisque longiores; quæ his subjacent omnes versus apicem quoad tertiam partem albæ, reliqua vero earum pars albescenti-cinerea in cæruleum vergens.

In cauda expansa duæ illæ nigræ longissimæ pennæ medium occupant, seu sunt 6, 6; his proximæ sunt 5, 5; prioribus 6 lin. G. breviores, quarum dimidia pars versus apicem alba, reliqua vero albescenti-cinerea in cæruleum vergens una cum macula nigra interioris partis in ipsis limitibus inter album & cæruleum, & sub hæ alia macula obsoleta rufa. Pennæ 4, 4; 3, 3; 2, 2, superne quoad tertiam partem versus apicem albæ, tantillum cinerei interspersi; versus basin magis cinereæ; inferne in medio inferioris partis macula nigra, & versus apicem macula rufo-fusca seu ferruginea. Pennarum 1, 1, pars exterior alba, interior vero versus basin alba, in medio macula nigra, sub hac macula rufa, versus apicem hæ cinereæ sunt. Ceterum Rectrices 1, 1, fere $\frac{2}{3}$ breviores quam 6, 6; intermediarum vero longitudo proportionata. Uropygium cinereum; tectrices caudæ superiores cinereæ; inferiores vero seu sub cauda albissimæ.

Pectus rufum, qui color versus inferiorem partem dilutior evadit.

Venter albus.

Femora sordide alba. *Tibiae* nudæ, rubentes, *Digiti* omnes, tres antici, & unicus posticus, rubentes; ungues nigri.

FŒMINA:

Rostrum, Nares, Oculi, Lingua ut in Mare.

Caput superne & ad latera, collumque superne cinereum, splendens. Ad latera colli idem color cupri splendidissimus ac in Mare.

Dorsum ut in Mare.

Remiges primariæ 10, quarum ordine tertia omnium longissima; deinde quod ad longitudinem ordine succedunt quarta, prima, secunda, & sic deinceps. Color remigum primariarum & secundariarum tectriciumque idem ac in Mare.

Cauda fere ut in Mare. Uropygium tectricesque caudæ itidem.

Sub rostro alba. *Pectus* dilute fuscum. Venter sordide albus.

Femora, Tibiae, Pedes, Digitiqu eut in Mare. *Ungues* nigri, apice albo.

The size of these Pigeons is about that of a Ringdove.

Their long tail distinguishes them from other Pigeons.

The splendid color which the male and the female have on the sides of the neck and even a little beyond it, is also peculiar, in that the feathers in that region are as if covered with a finely resplendent copper [color], with a purple tint, which back of the neck shifts more into green, particularly with reference to its position toward the light. Rarely is this color more finely repro-

duced than in this bird. Mr. Catesby calls it a golden color, but it can hardly be termed that.

In the copy of Mr. Catesby's work which I have seen, both the head and the back are of a darker color, and the breast is also of a redder color than the bird actually has. This I could very well see when I laid a recently killed male beside Mr. Catesby's figure, as it is the male which is reproduced in his work. Mr. Edward [sic] has entirely omitted the above mentioned copper color both in his description and his figure. It may be that some of the young ones do not have it; but it was found on all those which I have handled, and which were killed in the spring.[1]

Quite a number of these Pigeons may be seen every summer in the woods of Pennsylvania and New Jersey and the adjoining provinces, in which region they live and nest; and it is very seldom that a greater number of them are not observed there in the spring, during the months of February and March, than in the other seasons of the year. But there are certain years when they come to Pennsylvania and the Southern English Provinces in such indescribable multitudes as literally to appall the people. I did not, however, have the opportunity of witnessing such personally (although the spring of the year 1749, when I was there, was considered as one of those in which a greater number of these Pigeons appeared than had been the case for some years previously: yet it was not one of the particular or more unusual ones); but all persons who had observed these happenings and lived long enough to remember several of them recited several incidents connected therewith. Some had even made short notes of various details, of which I will cite the following:

In the spring of 1740, on the 11th, 12th, 15th, 16th, 17th, 18th and 22nd of March (old style), but more especially on the 11th, there came from the north an incredible multitude of these Pigeons to Pennsylvania and New Jersey. Their number, while in flight, extended 3 or 4 English miles in length, and more than one such mile in breadth, and they flew so closely together that the sky and the sun were obscured by them, the daylight becoming sensibly diminished by their shadow.

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[1] Edwards' figure represents a distinct species of another genus, namely the *Columba* (= *Zenaidura*) *macroura*.

The big as well as the little trees in the woods, sometimes covering a distance of 7 English miles, became so filled with them that hardly a twig or a branch could be seen which they did not cover; on the thicker branches they had piled themselves up on one another's backs, quite about a yard high.

When they alighted on the trees their weight was so heavy that not only big limbs and branches of the size of a man's thigh were broken straight off, but less firmly rooted trees broke down completely under the load.

The ground below the trees where they had spent the night was entirely covered with their dung, which lay in great heaps.

As soon as they had devoured the acorns and other seeds which served them as food and which generally lasted only for a day, they moved away to another place.

The Swedes and others not only killed a great number with shotguns, but they also slew a great quantity with sticks, without any particular difficulty: especially at night they could have dispatched as many as their strength would have enabled them to accomplish, as the Pigeons then made such a noise in the trees that they could not hear whether anything dangerous to them was going on, or whether there were people about. Several of the old men assured me that in the darkness they did not dare to walk beneath the trees where the Pigeons were, because all through the night, owing to their numbers and corresponding weight, one thick and heavy branch after another broke asunder and fell down, and this could easily have injured a human being that had ventured below.

About a week or a little later subsequent to the disappearance of this enormous multitude of Pigeons from Pennsylvania and New Jersey, a sea-captain by the name of Amies, who had just arrived at Philadelphia, and after him several other sea-faring men, stated that they had found localities out at sea where the water, to an extent of over 3 French miles, was entirely covered by dead Pigeons of this species. It was conjectured that the Pigeons, whether owing to a storm, mist, or snowfall, had been carried away to the sea, and then on account of the darkness of the following night or from fatigue, had alighted on the water and in that place and manner met their fate. It is said that from that date no such tremendous numbers of this species of Pigeon have been seen in Pennsylvania.

In the beginning of the month of February, about the year 1729, according to the stories told by older men, an equally countless multitude of these Pigeons as the one just mentioned, if not a still larger number, arrived in Pennsylvania and New Jersey. Even extremely aged men stated that on 3, 4, 5 or several more occasions in their lifetime they had seen such overwhelming multitudes in these places; and even the parents of these people had in their turn told them that the same phenomenon had occurred several times during their own lives; so that 11, 12, or sometimes more years elapse between each such unusual visit of Pigeons.

From Lawson's *History of Carolina*, p. 141, I see that in the winter of 1707, which was the severest known in Carolina since it was settled by Europeans, an equally awe-inspiring number of these Pigeons had made an appearance in Carolina and the other Southern English Settlements, driven thither by causes which I will now mention.

The learned and observant Doctor Colden told me that during his stay in North America, where he had been since the year 1710, at his country place Coldingham, situated between New York and Albany, he had on two distinct occasions, although at an interval of several years, witnessed the arrival of these Pigeons in such great and unusual numbers that during 2 or 3 hours, while they flew by his house, the sky was obscured by them, and that they presented the appearance of a thick cloud.

All the old people were of the opinion that the months of February and March is the single season of the year when the Pigeons swoop down upon Pennsylvania and the adjacent English Provinces in such marvelous quantities; at other seasons of the year they are not to be seen in any great numbers.

The cause of their migrations from the upper part of the country in such great quantities at this season is twofold: first, when there is a failure of the crop of acorns and other fruit in the places where they otherwise generally spend the winter, thus rendering their supply of food insufficient to last until the ensuing summer; and second, and chiefly, when an unusually severe winter with abundant and long remaining snow happens to occur in their customary winter haunts, thus covering the ground and making it impossible for them to secure the acorns, beech-nuts and other fruit and seeds on which they otherwise feed at this season: in such cases they are forced to leave these localities and seek their food down along the sea coast where the winters, owing to the sea air, are always milder, and the ground more and earlier free from snow. Experience has shown that both of these circumstances have caused their migrations to take place in such great multitudes.

A peculiar fact and one which older persons have unanimously maintained to be true, is that on all occasions which they could remember, when the Pigeons appeared in such great numbers, there had always been during the preceding autumn, in Pennsylvania and adjacent localities, an abundant crop of acorns and other arboreal seeds, excelling that of several previous years; but during their stay the Pigeons had so carefully searched and ransacked all possible nooks and corners that after their departure it was almost impossible to find a single acorn in the woods.

Several extremely aged men also declared that during their childhood there were, in summertime, many more of the Pigeons in New Sweden than there are now; the cause of this is that the country is at present much more populous and cultivated and the woods more cleared off, and as a result the Pigeons have either been killed off or scared away.

As nearly all the inhabitants of Pennsylvania and the English settlements in the South did not quite know whence these numberless swarms of Pigeons came from, they entreated me to ascertain, during my journeys in the interior of the country, where so many were to be found in summertime, what their food and other economic requirements were at that time of the year, and so on. During my journey to and within Canada I found the desired occasion of learning all of this, which I will now briefly relate.

When toward the end of June, 1749 (new style), I had left the English Colonies, and set out for Canada through the wilderness which separates the English and French Colonies from each other, and which to a great extent consists of thick and lofty forests, I had an opportunity of seeing these Pigeons in countless numbers. Their young had at this time left their nests, and their great numbers darkened the sky when they occasionally arose *en masse* from the trees into the air. In some places the trees were full of their nests. The Frenchmen whom we met in this place had shot a great number of them, and of this they gave us a goodly share. These Pigeons kept up a noisy murmuring and cooing sound all night, during which time the trees were full of them, and it was difficult to obtain peaceful sleep on account of their continuous noise. In this wilderness we could hear in the night time, during the calmest weather, big trees collapsing in the forests, which during the silence of the night caused tremendous reports: this might in all probability be ascribed to the Pigeons, which according to their custom had loaded a tree down with their numbers to such an extent that it broke down: although other causes might also be found, whereof more is mentioned in the third volume of my American Journey. The additional observations which I had occasion to make as to their economy and manner of life, during my stay in North America, both in Canada, the wilderness of the English Colonies, and in the land of the savages, are as follows:

The birds spend the entire summer in Canada, and particularly do they nest in the vast wild forests and wastes which abound there, where no men are to be found and where seldom any human being ventures. When in summer a person travels through these forests he might easily become terrified by the enormous number of these birds, which in some places almost entirely cover the branches of the trees and, when taking wing, obscure the sky. These Pigeons have, however, their distinct boundaries, outside of which they do not often venture; as for example, somewhat south of Bay St. Paul, which is 20 French miles north of Quebec, not very many of them nest in the woods; and the cause of this is said to be that the oak and the beech tree, which supply them with their principal food, are here arrested in their growth, and grow no further north.

In forests where there are human settlements or where the country is inhabited, only a few are to be seen; and as the land is being gradually cultivated by man, the Pigeons move further away into the wilderness. It is maintained that the cause of this is, partly, that their nests and young are disturbed by boys, partly their own sense of a lack of safety, and finally that during a great part of the year their food is shared by the swine.

They build their nests in high trees, pine trees as well deciduous ones; often as many as 40 or 50 nests are to be found in the same tree.

Some maintain that they raise two broods of young every summer.

In places where they nest in abundance the ground is often covered with their droppings to a thickness of one or two feet.

While these birds are hatching their young, or while the latter are not yet able to fly, the savages or Indians in North America are in the habit of never shooting or killing them, nor of allowing others to do so, pretending that it would be a great pity on their young, which would in that case have to starve to death. Some of the Frenchmen told me that they had set out with the intention of shooting some of them at that season of the year, but that the savages had at first with kindness endeavored to dissuade them from such a purpose, and later added threats to their entreaties when the latter were of no avail.

In Canada it is almost everywhere the custom for young farmhands and boys to investigate where the Pigeons have their nests, and as soon as the young are able to fly they are taken from the nest and brought to the farm, where they are afterward kept in suitable quarters and industriously fed, whereupon they are killed and eaten. To make doubly sure that they do not escape, one of their wings is generally cut short so that even in case they do get out, they cannot fly away. Such nestlings have a good appetite, thrive comfortably, become quite tame and within a short time, if well taken care of, accumulate so much fat that they afford a most palatable dish.

For *food* these Pigeons select the following fruits, which I will name in the order that they mature:

Seeds of the *Red-flowered Maple* [*Acer*]; these mature in Pennsylvania at the end of May, but somewhat later further North.

Seeds of the *American Elm* [*Ulmus americana*]; these mature in Pennsylvania in the beginning or middle of June, but further north somewhat later. When on our journey through the wilds between Albany and Canada we cut up some of the Pigeons which the French had shot and given us, their crops were generally found to be full of elm-seeds.

Mulberries. These ripen in Pennsylvania in the beginning of June (new style), and are relished by these Pigeons almost above everything else. During my stay in the last mentioned locality, in 1750, I noticed that as soon as the mulberries became ripe the pigeons put in their appearance in great numbers. Wherever a Mulberry tree grew wild it was at this time generally full of Pigeons which devoured the berries. They often caused me much vexation because if I had located a Mulberry tree in the woods with the intention of securing seeds when the berries became ripe and it should happen that I did not watch out for the proper time, the Pigeons had generally, in the meanwhile, been so industrious in their picking that on my arrival scarcely a single berry was left. If some of them were shot the others generally flew away a little distance, but returned within a few minutes to the same Mulberry tree; so that a person who owned such trees found no difficulty to obtain daily a sufficient quantity of choice meat as long as the mulberries lasted.

They consume *all kinds of grain*, with the single exception of corn, which is left untouched by them, although it has other enemies. I noticed that they were particularly fond of the following kinds of grain:

They ate *Rye*, although not with particular avidity, but rather as if in the absence of something else more palatable. Some persons assured me that they had seen with their own eyes how these Pigeons, during summer time, when they had come to a ripe wheat field, alighted on the fences, vomited up the Rye on which they had previously feasted, and then swooped down upon the wheat field, where they gorged their crops with wheat, as being more appetizing.

Wheat is one of their most coveted foods, which may be seen from what has already been stated, as well as from many another experience. As soon as the wheat fields become ripe they swoop down on them in enormous numbers and take considerable toll of them. When the wheat is stacked up in the field they also visit it and devour all too much of it, if they should happen to be in the least hungry. In the fall, when the wheat is recently sown, they alight in full force in the fields and not only pick up the grains which are more or less in broad daylight, but also poke up those which the plough has not sunk sufficiently deep. In order to prevent such a damage boys as well as others are seen at this season of the year running around armed with guns and other "contraptions," to kill or scare them away. On such occasions, however, they are not in general particularly timid, especially the young ones, so that when a few of them have been shot at a stack, the others oftentimes fly away only a short distance to another stack, and hence the gunner, albeit he has made some lucky shots, generally becomes exhausted before the birds become scared. In Pennsylvania this species of grain, as well as the Rye, commonly ripens about midsummer (old style), and sometimes earlier; but further North it ripens later.

Buckwheat they are also very fond of, and levy considerable tribute on it. The Buckwheat matures in Pennsylvania in the middle of September, old style.

The berries of the *Tupelo or Sour-gum tree* (*Nyssa*), they also consume with great avidity. In Pennsylvania these ripen in September. This tree does not grow in Canada.

Acorns.— Most forests in North America consist of oak, of which arboreal genus there are several species; of these the greater part have nearly every year a great number of acorns which in the autumn fall off in such quantities that quite often the ground below the oaks is covered by them one hand high and sometimes more. These serve as food for several kinds of animals and birds, as for instance Squirrels of several species, Forest Mice, Wild Pigeons, &c., in addition to which, in places inhabited by Europeans, they serve as the staple food of hogs during the greater part of the year. During certain years the numberless swarms of Wild Pigeons already described come to Pennsylvania and the other English Provinces, in search of these acorns. In Pennsylvania and other localities in North America the acorns mature in September and the following months.

They are also very fond of *Beech-nuts*. There is a great abundance of beech-trees in Canada, but further south they grow somewhat more sparsely. In Canada the nuts become ripe in the middle of September. These, together with acorns, constitute the principal food of the Pigeons during the entire latter part of the fall and throughout the winter.

In addition to the kinds already enumerated they also consume various other seeds and berries of trees and plants which grow in this country.

The trees above referred to, the seeds and berries of which the Pigeons are so fond of, grow in the forests of North America nearly everywhere in great abundance. In a good many places, especially further inland, oaks, elms, beeches and the red-flowered Maple constitute almost alone, with the addition of the Walnut tree, the entire forest tract. Thus it will be seen how the all-wise CREATOR, even in the case of these birds, has so wisely adapted the size of the food supply to the number of mouths to be fed.

I have also observed that the Pigeons have a special fondness for the kind of soil which is much mixed with common salt [alkaline deposits]; this soil serves them as food, as a spice to blend with the food, or for its medical properties,— I do not know which. At the Salt springs of Onondago [*sic*], in the tribe of the Iroquois Indians, where the soil is so strongly mixed with salt that the ground during a severe drought becomes entirely covered with it and as white as frost, making it impossible for plants to grow, I noticed with astonishment, in the month of August, 1750, how covetous the Pigeons were of this kind of soil. The Savages in Onondago had built their huts on the sides of this salt field, and here they had erected sloping nets with a cord attachment leading to the huts where they were sitting: when the Pigeons arrived in swarms to eat of this salty soil, the Savages pulled the cords, enclosing them in the net, and thus at once secured the entire flock. At certain times, when they came in such numbers that the ground could hardly be seen for them, the Savages found it more advisable to use a gun, as by a single discharge of birdshot they could sometimes kill as many as 50 or more; and this proved a splendid source of food supply.

These Wild Pigeons fly in the same manner as other Pigeons; and as soon as they have alighted in a tree or other place they have a habit of making a clapping sound with their wings which, according to some, is a signal for all the others to alight. At times and when they have had sufficient food, they are quite timid, especially the old birds. Therefore, when one wishes to shoot them it is best to walk to and fro among them, on the ground, as if one did not see them: then they are not so timid, nor do they take wing so soon.

In the vast forests of Canada they remain to the end of August or beginning of September (new style); *i. e.*, until the grain has been stored for the winter. A great number, however, remain until late in the autumn, when the first snow begins to fall, which finally drives them all away. As their food mostly consists of acorns, beech nuts and the seeds and fruits of other trees which become hidden under the snow, they are obliged to leave these places and betake themselves further South, where the ground is bare all winter. Not one of them remains in Canada throughout the winter: but they generally spend this season in the vast forests of the *Illinois*, who live at about the same latitude as Pennsylvania and Virginia. They do not willingly migrate toward the Seaboard, where the country has been extensively cultivated by the English, and the forests are much cut down; partly because they cannot there secure a sufficient food supply, and partly to avoid running the risk of getting killed by the number of people and gunners in that section. They prefer the vast and dense forests in the interior of the country where there are no human habitations for many miles around. But, should it happen during a certain year that there is a failure of the crop of acorns or other food suitable for them, or an unusually severe winter with great snow fall sets in, which to some extent covers the ground, then they are forced to leave their usual winter quarters and seek their way to the English settlements down the sea-board. It is on these occasions that they swarm into Pennsylvania in such enormous numbers; but as soon as the weather changes a little and becomes milder, they again retire further inland. Here they remain until the last snow disappears in the spring.

As the snow gradually melts away in the spring the Pigeons migrate further and further North, and when northern Canada is free from snow, which generally occurs toward the end of April or the beginning of May, the Pigeons arrive in their old haunts and commence their mating, nesting, hatching of eggs and the rearing of their young, etc.

The French in Canada, who annually catch a number of young Pigeons alive which they thereafter rear at their homes, have taken much pains to tame these birds, although with but little success. It is very easy, when they are kept in suitable quarters to make them so tame as to feed from one's hands, in the manner of any other domesticated Pigeon; but as soon as they are let out into the open hardly a few days pass before they fly away to the woods, nevermore to return. It was, however, emphatically asserted, that some had succeeded in taming them to the same extent as the domesticated Pigeons.

As they fly in great flocks and keep close together, whether on the wing, on the ground or in the trees, so poor a marksman as to fail to make a hit is difficult to find. Several persons told me that a man who lived at Schenectady, between Albany and Col. Johnson's farm, had killed 150 of these birds with two discharges of birdshot, and in Canada there is said to have been several cases where 130 had been killed in a single shot.

Their flesh is a delight to the epicure, and especially is the meat of the young Pigeons scarcely second in delicacy to that of any other bird.

The great French Admiral Marquis de la Galissoniere, who in deep knowledge of various sciences, but especially in natural history and its advancement, has had or has very few equals, and who at the time of my arrival in Canada occupied the office of Governor-General of that country, told me that he had once brought with him several of these Pigeons from Canada to France, and that he had allowed them to escape in the French forests. At this time he had again collected a great number of live birds which in the fall of 1749 he brought with him to France, enclosed in large cages, in order to set them free in the woods, upon his safe arrival there, with the intention of introducing this handsome as well as useful American bird into Europe.

In addition to the authors referred to above, the following learned men have also mentioned something in their writings concerning these Pigeons, namely: P. de Charlevoix, *Histoire de la Nouvelle France,* T. V, pp. 251–252; Salmon's *Modern History,* Vol. III, p. 440; Williams' *Key into the Language of America,* p. 91. Others whom I have not had the opportunity of seeing may also have mentioned something concerning this subject, but they have at least related nothing of any particular value.

A YEARS' COLLECTING IN THE STATE OF TAMAULIPAS, MEXICO.

BY JOHN C. PHILLIPS.

ON THE first of August, 1908, the well-known collector, Mr. Frank B. Armstrong, began work in the State of Tamaulipas, Mexico, collecting the series of birds which is listed below. The work was continued for one year.

The localities visited ranged from Matamoros, at the northeast extremity of the State, to Altamira in the extreme south. Most of the time, however, was spent in the hill region west and north of Ciudad Victoria in the valleys of the Sierra Madre mountains, which here form the western boundary of the State of Tamaulipas, and along the river valleys east of the mountains. It may be well to mention here the general character of the stations represented by the collection, beginning with Matamoros.

The country about Matamoros is the level valley bottom of the Rio Grande, where the general vegetation is chaparal, bunch cactus and mesquite, at a level of only eighty feet above the sea. San Fernando, some seventy miles south on the River Presos, is also near the coast, and is surrounded by a country very much like that of the Rio Grande Valley, and of low elevation. These regions were visited in August, October, December and February.

The intermediate region embraces the several localities lying north and west of Ciudad Victoria. It can be roughly divided into a mountain region: Santa Leonor, and the hill settlements of Realito, Carricitos, Montelunga, Galindo, Rampahuila, Portrero, Guiaves; and a plain region, embracing the following river localities: Santa Engracia, Caballeros, Cuidad Victoria, Martinez and La Cruz. Both of these regions were visited in autumn, September and October; and again in March, April, May, June and July. The following description of the two regions is taken from Mr. Armstrong's letters:

"Santa Leonor is at the base of the mountains, at the mouth of a great cañon. Here the trail starts up the first hill in a winding course until it reaches the summit, and thence downward a little;

and then ascends the second ridge of hills, and so on over about four great hills until Realito is reached, at an elevation of about 8000 feet. This same trail forks out in different directions to various mines and settlements throughout the mountains. At Santa Leonor the scrub brush disappears, and around and in the cañon there are heavy ebony forests mixed with elm (probably not a true elm) and buttonwood trees which attain a great height, with a heavy underbrush and many vines, so thick that one can scarcely see six feet through it. Here is the home of Brasher's Warbler, Berlandier's Wren, Blue-crested Mot-mot, and Coppery-tailed Trogon. The only chance to catch a glimpse of these birds is when they cross a trail or wood road, as the thicket is so dense and tangled that one can hardly push a way through it.

"This is the condition of the cañon until it reaches considerable elevations, or traverses several miles. Above Santa Leonor, on the trail that ascends the first hill, in going up, one passes through a thicket of green bushes with heavy foliage, and from this to more open places, with scrubby, spreading bushes and big rocks, and further up the oak begins with tall grass and boulders everywhere. This continues on the ascent for some way, when the great pines [1] begin; and then at an elevation of say 3000 feet, up to 10,000 feet, the mountains are about the same: immense pines over the slopes, intermixed with oaks, and tall grass and boulders everywhere.

"Most of the birds labelled Santa Leonor were taken in the cañon and in front of the cañon where the plains begin, very few being taken on the hill slopes back of or above the town.

"Carracitos (6000 feet) is the name given a valley between two ridges, where a dam was constructed making a small lake. This place being flat, or nearly so, is covered with a big pine grove with oaks and boulders on the slopes on either side of it. Here are Wild Turkey, Deer and Massina Partridge; and on the slopes, Couch's Jay, Ant-eating Woodpeckers, Boucard's Sparrow, Jouy's Warbler, and Hepatic Tanager. This place is used by freighters to pasture and rest up their pack mules, and has been a camping place for many years. The first Smith's Nightingale Thrush was taken on

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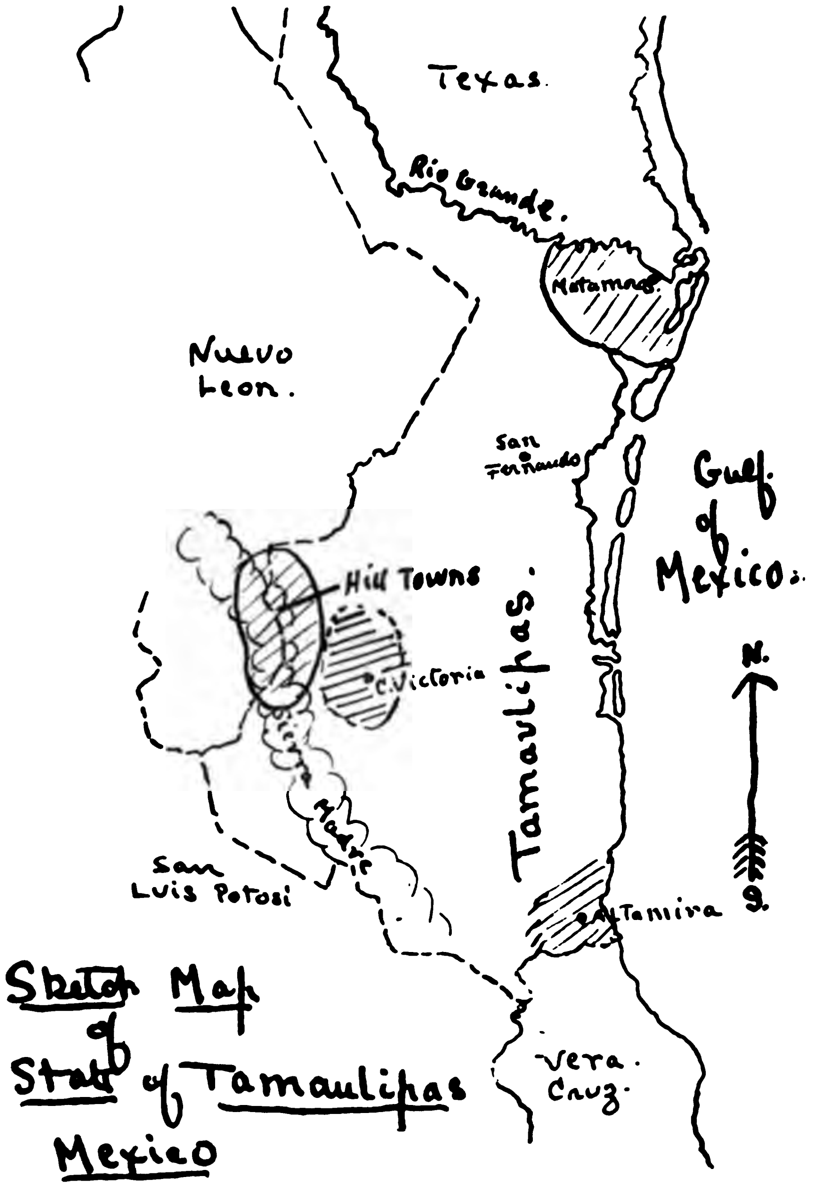
[1] Probably *Pinus cerunoides* and *P. nelsoni* on the lower slopes, and *P. ponderosa* and a form of *P. montezumæ* on the higher slopes, according to a letter from Mr. G. R. Shaw.


Texas.
Rio Grande.
Matamoros.
Nuevo Leon.
San Fernando
Gulf of Mexico.
Hill Towns
C. Victoria
Tamaulipas.
N.
S.
Madre
San Luis Potosi
Altamira
Vera. Cruz.
Sketch Map of State of Tamaulipas Mexico

the slopes above this point, the only bird of the species seen here. Afterwards, in an entirely different locality, many were taken. They will be mentioned further on in the description of Galindo.

"The next place is Montelunga, situated on a little plateau, "mesa," or table-land, at an elevation about 5000 feet. Here the trees are all tall pines, except in a cañon which skirts the place, where tall trees like elms are found, and some underbrush.

"Azure Bluebirds were taken on the table-lands; also Boucard's Sparrow; several species of warblers in migration; Couch's Jay; woodpeckers, etc.; and in the cañon, solitaire or "silgara" wrens, and trogons.

"The next station Galindo is peculiarly well adapted for bird collecting. It is really a wide cañon with great slopes on each side, towering to a height of several thousand feet, and shutting in a valley of some miles of dense, damp virgin forest. The mountain sides shut out the winds, and make Galindo as silent as night. At one end of the valley is a small settlement of miners — only a few houses. At the other end is the forest the trees in which attain to so great a height that a charge of shot will not reach the upper branches.

"Among the birds taken here were hummingbirds of different kinds, attracted by the great variety of flowers and air plants. The shady depths of this place are the home of two species of whippoorwill, and in about the same spots we found a number of Smith's Nightingale Thrush, and the Fulvous Nightingale Thrush. They, like many other birds, were placed by their note, which was heard plainly through the stillness of the forest. Throughout this same damp forest were found various warblers, vireos, tanagers, trogons, thrushes, etc., and on the slopes, jays, woodpeckers, and other forms that inhabit the mountains everywhere.

"Realito, at a still higher elevation, is also a mining settlement of two or three huts near a spring close to the summit of a big mountain, the country is level or rolling, and covered with pines and oaks. Here the birds differed a little from those of Galindo.

"Similar in character are Rampahuila and Portrero, mining camps nearby.

"Guiaves cañon is like Galindo, but is narrower and its slopes are perpendicular, with more bare cliffs. The cañon is also much deeper, but the vegetation is the same as at Galindo. The plains in front of Santa Leonor are all much alike, as are the mountains for the most part.

"The stony plains regions are covered with a plant called anacquito; and the ground is almost bare of grass. The country is slightly rolling and uniform, except for the river bottoms. These plains are threaded by a number of little streams, at intervals of some ten or fifteen miles. Along these water courses is a growth of tall elm and other big trees; also cypress, and an underbrush of green saplings, vines, and weeds. The streams are Cruz, Santa Engracia, Caballero, Martinez, and Victoria; and a description of one suits the others. The map shows their location; and their vegetation and general character are the same. They are strong, and very shallow; some places only two inches deep, and from sixty to two hundred feet wide."

"Altamira[1] in the lowlands has a sandy soil, tropical vegetation, except for oak timber, and numerous tule swamps. There are very few wagon roads, all traffic being done on horseback over trails. The forest in places is a regular jungle, with vines and rank foliage and several species of stunted, thorny bushes, or trees, in the higher places; and a weed-like pineapple plant (called "huipia") covers the ground and makes the woods practically impassable, on account of the cat-claw thorns along its leaves. Hunting can be done only along cut trails through the forest; a bird falling twenty feet from the trail is seldom secured, as a few steps through this hiupia will generally throw a man down, claw him, and nearly prevent him from getting on his feet. Mosquitoes, fevers, 'nighuas' (a flea that buries itself in the flesh), and everything else that is disagreeable, attend camping in this section."

As to the climate of Tamaulipas, Mr. E. W. Nelson of the United States Biological Survey has been kind enough to furnish me with notes of a general character. He says that the climate, like that of the rest of eastern Mexico, is divided into a wet and a dry season. The wet season begins in June and July and lasts till from September to November. The dry season covers the rest of the year, interrupted, however, by cold winter storms which are usually the southern prolongation of Texas "northers." The northern part of the State is subject to severe frosts, but the southern part is beyond the ordinary frost belt. Summer rains are usually plentiful along the coast lowlands, which occupy the largest part of the State, but the northern half is sometimes subject to prolonged and excessive droughts.

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[1] Altamira, in the extreme southeastern part of the State, was visited in the last eighteen days of December, but owing to the severe malaria which Mr. Armstrong contracted in the humid swamps, the region was not visited again.

The heaviest rains in the State fall in summer along the mountain chain in the western part (Sierra Madre). The southern part has regularly a much greater summer rainfall than the northern half.

Special thanks are due Mr. E. W. Nelson for time generously given in comparing many of our series of birds with those in the National Museum. To Mr. Outram Bangs is due credit for a large share of the work in sorting and arranging specimens as the material came in, and for valuable help.

The collection, of which an annotated list follows, is now merged in the general collections of the Museum of Comparative Zoölogy at Cambridge.

List of Species.

ARDEIDÆ.

Herodias egretta (*Wilson*).— 1 ♂, Matamoros, Jan. 24.

Egretta candidissima candidissima (*Gmelin*).— 1 ♀, Matamoros, Jan. 23.

Hydranassa tricolor ruficollis (*Gosse*).— 1 ♂, Matamoros, Jan. 20.

Nyctanassa violacea violacea (*Linn.*).— 1 ♂, Matamoros, June.

Heterocnus cabanisi (*Heine*).— 1 ♀, Rio Cruz, May 9.

IBIDIDÆ.

Plegadis guarauna (*Linn.*).— 3, both sexes, Matamoros, Jan. 21–Feb. 9.

ANATIDÆ.

Olor buccinator (*Richardson*).— 1 ♀, Matamoros, Jan. 21. This is a typical specimen of the species and constitutes its first Mexican record.

Cairina moschata (*Linn.*).— 2 ♀: Altamira, Dec. 31; Rio Cruz, May 13.

Chen hyperboreus hyperboreus (*Pallas*).— 1 ♀, Matamoros, Jan. 21.

Chaulelasmus streperus (*Linn.*).— 3, both sexes, Matamoros, Jan. 20–31.

Mareca americana (*Gmel.*).— 1 ♂, Matamoros, Jan. 20.

Nettion carolinense (*Gmel.*).— 1 ♀, Rio Martinez.

Dafila acuta (*Linn.*).— 4, both sexes, Matamoros, Jan. 26–Feb. 13.

Querquedula discors (*Linn.*).— 1 ♂, Matamoros, Jan. 18.

Querquedula cyanoptera (*Vieill.*).— 1 ♂, Matamoros, Jan. 19.

Spatula clypeata (*Linn.*).— 2 ♂, Matamoros, Feb. 1.

Marila americana (*Eyt.*).— 1 ♀, Matamoros, Jan. 22.

Marila vallisineria (*Wilson*).— 3, both sexes, Matamoros, Jan. 25–Feb. 11.

Marila affinis (*Eyt.*).— 2 ♂, Matamoros, Jan. 26.

FALCONIDÆ.

Micrastur melanoleucus (*Vieill*).— 1 ♂, Caballeros, Sept. 7.

Geranospizias niger (*Du Bus*).— 1 ♀, Cañon Guiaves, Sept. 15.

Parabuteo unicinctus harrisi (*Aud.*).— 3 ♂: Matamoros, Dec. 5–Jan. 31; Altamira, Dec. 17.

Accipiter velox (*Wilson*).— 3, both sexes: Montelunga, Oct. 12; Altamira, Dec. 20; Galindo, April 22.

Accipiter cooperi (*Bonap.*).— 1 ♂, Matamoros, Nov. 16.

Buteo borealis calurus *Cass.*— 1 ♂, Galindo, March 21.

Buteo albicaudatus sennetti *Allen.*— 5, both sexes: Altamira, Dec. 28–30; Matamoros, Jan. 18.

Asturina plagiata *Schlegel.*— 7, both sexes: Altamira, Dec. 20–21; Rio Martinez, Feb. 28–March 2; Santa Leonor, March 9; Rio Cruz, May 10–14.

Rupornis griseicauda *Ridgw.*— Altamira, Dec. 17–22; Caballeros, Sept. 7; Rio Cruz, June 19–24; Santa Leonor, April 14.

Urubitinga anthracina (*Litch.*).— 3, both sexes: Galindo, March 22; Rio Cruz, May 7–8.

Urubitinga ridgwayi *Gurney.*— 3, both sexes, Altamira, Dec. 21–Jan. 4.

Elanus leucurus (*Vieill.*).— 2 ♀, Altamira, Dec. 16, 21.

Falco peregrinus anatum *Bonap.*— 1 ♂, Matamoros, Jan. 22.

Falco columbarius columbarius *Linn.*— 1 ♀ (young), Matamoros, Nov. 16.

Falco columbarius richardsoni *Ridgw.*— 1 ♂, Matamoros, Jan. 25.

Falco fusco-cærulescens *Vieill.*— 3 ♂: Cañon Guiaves, Sept. 17; Altamira, Dec. 23; Matamoros, Feb. 14.

Cerchneis sparveria phalœna (*Lesson*).— 2, both sexes, Matamoros, Nov. 8–Dec. 1.

TINAMIDÆ.

Crypturus mexicanus *Salvadori.*— 8, both sexes: Rio Cruz, April 16–July 7; Santa Leonor, April 12–16.

CRACIDÆ.

Crax globicera *Linn.*— 1 ♂, Guiaves, April 31.

Penelope purpurascens *Wagler.*— 2, both sexes, Guiaves, May 4.

Ortalis vetula mccalli *Baird.*— 7, both sexes: Rio Cruz, July 5; Rio Martinez, Feb. 23–March 1; Santa Leonor, March 10.

MELEAGRIDÆ.

Meleagris gallopavo intermedia *Sennett.*— 1 ♂, Rio Cruz, March 9.

ODONTOPHORIDÆ.

Callipepla squamata castanogastris *Brewster.*— 7, both sexes: San Fernando, Oct. 20–27; Aquas Calientes, May 8.

Colinus virginianus texanus *Lawrence.*— 8, both sexes: Matamoros, Aug. 20–Oct. 30; San Fernando, Oct. 19–20.

Colinus virginianus maculatus *Nelson.*— 63, both sexes: Guiaves, Sept. 21–April 31; Rio Santa, Sept. 8; Santa Leonor, Sept. 11–April 15; Rio Cruz, May 6–June 30; Montelunga, April 29; Victoria, April 12; Altamira, Dec. 1–25.

Cyrtonyx montezumæ montezumæ (*Vig.*).— 4, both sexes and 1 chick: Yerba Burna, Sept. 29–30; Rampahuila, Sept. 27; Carricitos, Oct. 15.

RALLIDÆ.

Porzana carolina (*Linn.*).— 1 ♂, Matamoros, Jan. 22.

JACANIDÆ.

Asarcia spinosa (*Linn.*).— 6, both sexes, Dec. 25–31.

CHARADRIIDÆ.

Podasocys montanus (*Townsend*).— 2, both sexes, Matamoros, Nov. 30.

Oxyechus vociferus vociferus (*Linn.*).— 1 ♂, Matamoros, Nov. 18.

Himantopus mexicanus (*Müll.*).— 1 ♂, Matamoros, Feb. 10.

Recurvirostra americana *Gmel.*— 1 ♂, Matamoros, Jan. 12.

Numenius americanus americanus *Wilson.*— 1 ♂, Matamoros, Feb. 11.

Numenius americanus parvus *Bishop.*— 1 ♂, Matamoros, Jan. 18.

Catoptrophorus semipalmatus semipalmatus (*Gmel.*).— 2, both sexes, Matamoros, Jan. 17–21.

Totanus flavipes (*Gml.*).— 1 ♂, Rio Cruz, May 11.

Actitis macularia (*Linn.*).— 1 ♀, Rio Martinez, Mar. 2.

Gallinago delicata (*Ord*).— 3 ♂, Altamira, Dec. 14–21.

COLUMBIDÆ.

Columba flavirostris flavirostris *Wagler.*— 6, both sexes: Altamira, Dec. 22; Rio Cruz, July 5–21.

Zenaidura macroura carolinensis (*Linn.*).— 1 ♂, Galindo, Oct. 1.

Scardafella inca inca (*Less.*).— 13, both sexes: Matamoros, Aug. 19–Nov. 3; San Fernando, Oct. 19–23; Rio Martinez, Feb. 25–March 2.

Chæmepelia passerina pallescens *Baird.*— 11, both sexes: Matamoros, Aug. 22–Dec. 5; San Fernando, Oct. 30.

Leptotila fulviventris brachyptera (*Salvadori*).— 1 ♂, Rio Cruz, June 18.

PSITTACIDÆ.

Ara militaris (*Linn.*).— 1 ♀, Rio Cruz, June 30.

Conurus astec (*Souancé*).— 10, both sexes, Altamira, Dec. 17–31.

Amazona oratrix *Ridgway.*— 1 ♀, Rio Cruz, June 30.

Amazona viridigena *Cassin.*— 5, both sexes: Rio Martinez, March 4; Rio Cruz, June 24–July 22; Santa Leonor, April 8.

CUCULIDÆ.

Coccyzus americanus americanus (*Linn.*).— 5, both sexes: Rampahuila, Sept. 26; Santa Leonor, Sept. 11; Galindo, Oct. 4; Guiaves, Sept. 19.

Crotophaga sulcirostris *Swains.*— 5, both sexes: Altamira, Dec. 27–28; Guiaves, Sept. 17–21; Matamoros, Aug. 24.

PICIDÆ.

Chloronerpes æruginosus *Licht.*— 16, both sexes: Rampahuila, Sept. 28; Rio Santa, Sept. 8; Santa Leonor, Sept. 13; Guiaves, Sept. 21; Portrero, Sept. 24; Rio La Cruz, Sept. 10–July 16; Galindo, March 21–23; Rio Martinez, Feb. 27.

Melanerpes formicivorus formicivorus (*Swainson*).— 20, both sexes: Yerba Burna, Sept. 29; Galindo, Oct. 3–March 26; Guiaves, Oct. 9; Realito, May 22–June 16.

Melanerpes aurifrons (*Wagl.*).— 14, both sexes: Matamoros, Nov. 4–Dec. 1; San Fernando, Oct. 21–30; Altamira, Dec. 10; Rio La Cruz, June 18.

Sphyrapicus varius varius (*Linn.*).— 14, both sexes: Matamoros, Nov. 27–Dec. 3; Galindo, March 15–April 23.

Dryobates villosus intermedius *Nelson.*— 4, both sexes: Galindo, Oct. 1–April 20; Montelunga, Oct. 10–April 29.

Dryobates scalaris bairdi (*Scl.*).— 11, both sexes: Matamoros, Aug. 17–Dec. 4; San Fernando, Oct. 24–27; Altamira, Dec. 13; Rio Martinez, Feb. 24.

Campephilus guatemalensis guatemalensis (*Hartl.*).— 4, both sexes: Santa Leonor, March 9–April 13; Rio Cruz, July 8.

Ceophlœus scapularis scapularis (*Vigors*).— 12, both sexes: Altamira, Dec. 2–20; Rio Santa, Sept. 8; Santa Leonor, Sept. 12, Mar. 13; Cañon Guiaves, Sept. 16; Rio Martinez, Mar. 4.

TROGONIDÆ.

Trogon mexicanus *Swains.*— 21, both sexes (including specimens in nesting and moulting plumage): Rampahuila, Sept. 28; Galindo, Oct. 1–May 23; Guiaves, Sept. 20; Rio Santa, Sept. 8; Montelunga, Oct. 11; Altamira, Dec. 20; Realito, June 4.

Trogon ambiguus *Gould.*— 37, both sexes: Santa Leonor, March 9–April 14; Rio Martinez, March 1–3; Galindo, March 16–April 20; Guiaves, May 1; Montelunga, April 27; Rio Cruz, June 25; Realito, May 24–July 16.

MOMOTIDÆ.

Momotus cæruleiceps (*Gould*).— 15, both sexes: Caballeros, Sept. 7; Rio Martinez, Feb. 23–March 11; Rio Cruz, June 27–July 6.

ALCEDINIDÆ.

Ceryle torquata (*Linn.*).— 4, both sexes: Rio Martinez, March 2; Rio Cruz, May 11.

Ceryle alcyon (*Linn.*).— 1 ♂, Altamira, Dec. 21.

Ceryle americana septentrionalis *Sharpe.*— 7, both sexes: Rio La Cruz, Sept. 10; Santa Leonor, Sept. 13; Rio Martinez, Sept. 9–March 3; Caballeros, Sept. 6.

STRIGIDÆ.

Strix virgata tamaulipensis subsp. nov.

Type (and only specimen), Rio Martinez, State of Tamaulipas, Mexico, Feb. 25, adult ♂, No. 49982, Museum of Comparative Zoölogy.

Characters.— Similar to true *Strix virgata* of southeastern Mexico and Central America, with transverse pale lines on the head and back, as in that form. Not with the pale markings above in the form of spots as in

S. v. squamulata of western Mexico, but with the general color of the upper parts even paler and grayer than in the latter form.

Measurements.— Type, adult ♂, wing, 243; tail, 145; tarsus, 46; culmen from forward edge of cere, 18.

Remarks.— This bird comes from the dry mountains of western Tamaulipas where the conditions are more arid than further south.

Otus asio mccalli (*Cass.*).— 2, both sexes, Rio Martinez, Feb. 26; Santa Leonor, March 31.

Speotyto cunicularia hypogæa (*Bonap.*).— 9, both sexes, Matamoros, Nov. 5–Feb. 14; Altamira, Dec. 12.

Glaucidium gnoma gnoma (*Wagler*).— 3, both sexes, Galindo, March 21–27.

Glaucidium phalænoides ridgwayi *Sharpe.*— 9, both sexes: Matamoros, Aug. 16; Rio Martinez, Feb. 24–March 5; Santa Leonor, April 3–4; Rio Cruz, June 20; Guiaves, April 31.

Asio flammeus (*Pontoppidan*).— 1 ♂, Matamoros, Dec. 1.

CAPRIMULGIDÆ.

Chordeiles virginianus henryi *Cass.*— 3, both sexes: Matamoros, Aug. 15–23; Montelunga, April 30.

Chordeiles acutipennis texensis *Lawr.*— 11, both sexes: Rio Cruz, June 19–July 20; Santa Leonor, April 14–17; Montelunga, April 28–29.

Nyctidromus albicollis merrilli *Sennett.*— 29, both sexes: Matamoros, Aug. 24–Nov. 26; San Fernando, Oct. 19–28; Altamira Dec. 13–19; Santa Leonor, April 16; Rio Cruz, July 2.

Antrostomus notabllis *Nelson.*— 8, both sexes: Santa Leonor, April 14–16; Rio Cruz, June 28–July 4.

Only two or three specimens of this bird were known to science until this series was secured.

Antrostomus vociferus macromystax (*Wagler*).— 25, both sexes: Galindo, Oct. 5–April 24; Santa Leonor, April 12–13; Montelunga, April 26; Realito, May 27–June 7.

MICROPODIDÆ.

Chætura richmondi *Ridgway.*— 2, both sexes: Carricitos, Oct. 15; Guiaves, Oct. 8.

TROCHILIDÆ.

Amizilis cerviniventris chalconota *Oberholser.*— 30, both sexe Altamira, Dec. 11–23; Matamoros, Aug. 27; Santa Leonor, March April 8; Rio Cruz, June 25–July 5.

Phæoptila latirostris (*Swainson*).— 20, both sexes: Santa Leono March 3–April 28; Realito, June 2.

Hylocharis leucotis (*Vieill.*).— 11, both sexes: Galindo, March 14–April 20; Realito, May 31–June 8.

Eugenes fulgens (*Swainson*).— 17, both sexes: Rampahuila, Sept. 26–28; Galindo, March 16–April 19; Realito, June 1–6.

Cœligena clemenciæ (*Less.*).— 7, both sexes, Galindo, March 19–April 19.

Archilochus colubris (*Linn.*).— 7, both sexes: Yerba Burna, Sept. 30; Galindo, Oct. 5–March 22; Rampahuila, Sept. 28; Guiaves, Oct. 7; Santa Leonor, April 5–6.

Selasphorus platycercus (*Swains.*).— 1 ♀, Santa Leonor, April 3.

Atthis heloisa (*Less & Delattre*).— 10, both sexes: Galindo, April 18–25; Realito, May 27–June 10.

DENDROCOLAPTIDÆ.

Xiphorhynchus flavigaster flavigaster *Swains.*— 2 ♀, Altamira, Jan. 1.

Picolaptes affinis affinis (*Lafr.*).— 11, both sexes: Galindo, Oct. 1–March 21; Realito, May 22–June 3.

COTINGIDÆ.

Platypsaris aglaiæ aglaiæ (*Lafr.*).— 12, both sexes: Galindo, Oct. 4; Rio Santa, Sept. 8; Altamira, Dec. 24; Rio Martinez, Feb. 28–March 4; Santa Leonor, March 7–10; Rio Cruz, July 12–21.

TYRANNIDÆ.

Camptostoma imberbe *Sclater.*— 3 ♂: Guiaves, Sept. 15–21; Altamira, Dec. 11.

Myiozetetes texensis texensis (*Giraud*).— 5, both sexes, Altamira, Dec. 10–Jan. 1.

Pyrocephalus rubinus mexicanus (*Scl.*).— 18, both sexes: Matamoros, Aug. 22–Dec. 5; San Fernando, Oct. 28; Altamira, Dec. 14–24.

Nuttallornis borealis (*Swains.*).— 10, both sexes: Galindo, Oct. 1–5; Guiaves, Oct. 7–9; Portrero, Sept. 24; Realito, Jan. 1–5; Montelunga, April 29.

Myiochanes pertinax pallidiventris (*Chapman*).— 23, both sexes: Rampahuila, Sept. 26–27; Yerba Burna, Sept. 29; Montelunga, April 29; Realito, May 28–June 8; Galindo, March 14–27.

Remarks.— This large series represents *pallidaventris* in its extreme form. The upper parts are grayer than in birds from Arizona and Sonora, especially about the neck. The under parts do not differ, and the wing measurements are the same.

Myiochanes virens (*Linn.*).— 4, both sexes: Matamoros, Aug. 28–Sept. 1; Caballeros, Sept. 6; Montelunga, April 27.

Myiochanes richardsonii richardsonii (*Swains.*).— 8, both sexes: Rampahuila, Sept. 27; Santa Leonor, Sept. 11; Guiaves, Sept. 18–Oct. 7; Montelunga, April 28–30.

Empidonax flaviventris (*Baird*).— 9, both sexes: Matamoros, Aug. 25–30; San Fernando, Oct. 21; Guiaves, Sept. 20; Galindo, March 16–20; Rio Martinez, Feb. 28.

Empidonax traillii traillii (*Aud.*).— 12, both sexes: Matamoros, Aug. 16–Aug. 30; Guiaves, Sept. 22.

Empidonax minimus (*Baird*).— 11, both sexes: Matamoros, Aug. 19–30; Rio Martinez, Sept. 9; Rio Cruz, Sept. 10; Caballeros, Sept. 7; Altamira, Dec. 13–14; Santa Leonor, April 9.

Empidonax hammondi (*Xantus*).— 10, both sexes: Galindo, March 14–20.

Empidonax wrighti *Baird*.— 1 ♂, Galindo, March 18.

Empidonax difficilis difficilis *Baird*.— 4, both sexes, Galindo, March 19–22.

Sayornis phœbe (*Latham*).— 22, both sexes: Matamoros, Oct. 27–Dec. 1; San Fernando, Oct. 21–25; Rio Martinez, Feb. 25–March 4; Galindo, March 17.

Sayornis saya (*Bonap.*).— 2 ♀: San Fernando, Oct. 26; Matamoros, Nov. 6.

Myiarchus crinitus crinitus (*Linn.*).— 2, both sexes: Yerba Burna, Sept. 29; Montelunga, Oct. 13.

Myiarchus magister nelsoni *Ridgway*.— 4, both sexes: Yerba Burna, Sept. 29; Portrero, Sept. 24; Matamoros, Aug. 13; Carricitos, Oct. 14.

Myiarchus lawrenci lawrenci (*Giraud*).— 18, both sexes: Altamira, Jan. 1; Yerba Burna, Sept. 30; Montelunga, Oct. 12; Galindo, Oct. 4; Altamira, Jan. 1; Rio Martinez, Feb. 25–27; Rio Cruz, June 28–July 8; Santa Leonor, April 3–12.

Myiodynastes luteiventris *Sclater*.— 1 ♀, Galindo, April 26.

Pitangus sulphuratus derbianus (*Kaup*).— 20, both sexes: Altamira, Dec. 13–25; Guiaves, Sept. 21; Rio Martinez, Feb. 25–March 1.

Tyrannus melancholicus couchii (*Baird*).— 7, both sexes: Altamira, Dec. 14–31; Santa Leonor, Sept. 11–12; Matamoros, Aug. 30; San Fernando, Oct. 19.

Muscivora forficata (*Gmel.*).— 21, both sexes, San Fernando, Oct. 19–29.

ALAUDIDÆ.

Otocoris alpestris giraudi *Henshaw*.— 8, both sexes, Matamoros, Aug. 21–29.

MIMIDÆ.

Toxostoma longirostre sennetti (*Ridgway*).— 5, both sexes: Matamoros, Nov. 2–20; Altamira, Dec. 10; Galindo, March 17; Rio Cruz, June 20.

Toxostoma curvirostre curvirostre (*Swains.*).— 11, both sexes: Matamoros, Nov. 3–Dec. 6.

Dumetella carolinensis (*Linn.*).— 2, both sexes, Altamira, Dec. 13.

Mimus polyglottos leucopterus (Vigors).— 1 ♂, Matamoros, Nov. 6.

TURDIDÆ.

Catharus mexicanus smithi *Nelson.*— 25, both sexes: Galindo, Oct. 4–April 20; Rampahuila, Sept. 27; Montelunga, April 26–29; Realito, May 22–June 11.

Remarks.— This form, which belongs to these mountains, was described by Nelson from a single specimen. It differs but slightly from true *mexicanus* of the uplands of Vera Cruz, one of the rarest of Mexican birds.

Catharus occidentalis fulvescens *Nelson.*— 7, both sexes, Galindo, March 17–April 24.

Hylocichla guttata guttata (*Pallas*).— 3, both sexes: Santa Leonor, March 10; Rio Martinez, March 2; Galindo, March 25.

Hylocichla guttata nana (*Aud.*).— 3, both sexes, Oct. 11–28.

Hylocichla guttata sequoiensis (*Belding*).— 7, both sexes: Galindo, March 17–25, April 20; Montelunga, April 26.

Hylocichla guttata auduboni (*Baird*).— 10, both sexes: Galindo, March 16–26; Montelunga, Oct. 11.

Hylocichla ustulata swainsoni (*Cabanis*).— 1 ♂, Galindo, April 24.

Planesticus migratorius propinquus (*Ridgway*).— 9, both sexes: 3, Galindo, March 15–22; 6, Realito, May 30–June 16 (only 2 males).

Remarks.— The resident birds of this region average a little smaller than true *propinquus* as recognized by Ridgway in 'Birds of North and Middle America.' Average length of wing of seven females 126, of two males 130. The series also averages a little paler than true *propinquus*, and possibly there is sufficient difference to warrant separation.

Planesticus grayi tamaulipensis (*Nelson*).— 6, both sexes: Galindo, March 16–April 22; Realito, May 31–June 5.

Sialia sialis fulva *Brewster.*— 15, both sexes: Montelunga, Oct. 13–April 29; Carricitos, Oct. 15–16; Yerba Burna, Sept. 30; Rampahuila, Sept. 27; Galindo, Oct. 3–March 27; Realito, May 29–June 1.

Myadestes obscurus occidentalis *Stejneger.*— 5, both sexes: Montelunga, Sept. 25–April 30; Realito, June 11; Santa Leonor, April 5

SYLVIIDÆ.

Regulus calendula calendula (*Linn.*).— 15, both sexes: Matamoros, Nov. 26–29; Guiaves, Sept. 15; Altamira, Dec. 10–14; Galindo, March 23–24; Santa Leonor, March 9–11.

Polioptila cærulea cærulea (*Linn.*).— 15, both sexes: Carricitos, Oct. 14; Guiaves, Sept. 17–20; Matamoros, Aug. 26–Nov. 28; Galindo

Oct. 2; Santa Leonor, Sept. 13; San Fernando, Oct. 25; Altamira, Dec. 11–12; Rio Martinez, March 3.

Remarks.— In this series the wing in the males runs from 50 to 54 mm. and in the females from 49 to 52 mm., thus all would appear to belong to the northern migratory form.

TROGLODYTIDÆ.

Heleodytes brunneicapillus couesi (*Sharpe*).— 3, both sexes, Matamoros, Dec. 3–6.

Heleodytes narinosus spec. nov.

6, both sexes: Carricitos, Oct. 15; Galindo, Oct. 1–March 22; Guiaves, Oct. 6–9.

Type from Galindo, Tamaulipas, Mexico; adult ♀, No. 49964, Mus. Comp. Zoöl. Collected March 22, 1909, by F. B. Armstrong.

Characters.— Similar to *H. jocosus* (Sclater) of Oaxaca City, Mexico, but differing in having a much shorter and stouter bill, the spots below smaller and less numerous; flanks much less distinctly barred with dusky. The nestling plumage shows the underparts practically unspotted, whereas in the nestling of *H. jocosus* the underparts are thickly covered with small dusky spots.

Measurements. (Four adults.)

	Wing.	Tail.	Tarsus.	Culmen.	Breadth of bill at mid nostril.
♂	72	58	24	20	5
♂	69	67	25	16	4
♀	75	66	24	20	5
♀	66	59	23	18	4

It appears from the small series available that this bird is very distinctly different from *H. jocosus* of the western slope of Mexico.

Pheugopedius maculipectus maculipectus (*Lafr.*).— 24, both sexes: Guiaves, Sept. 20; Rio Cruz, Sept. 10–July 15; Santa Leonor, March 7–April 13.

Thryothorus ludovicianus berlandieri (*Baird*).— 25, both sexes: Galindo, Oct. 5–March 23; Santa Leonor, Sept. 13–April 21; Guiaves, Oct. 6–7; Rampahuila, Sept. 28; Rio Cruz, July 19–22; Realito, May 29–June 3.

Thryothorus ludovicianus lomitensis *Sennett.*— 6, both sexes: Matamoros, Aug. 28–Nov. 29; San Fernando, Oct. 19–25.

Thryomanes bewickii cryptus *Oberholser.*— 23, both sexes: Matamoros, Aug. 18–Dec. 6; San Fernando, Oct. 21; Guiaves, Sept. 18.

Troglodytes aëdon parkmani *Aud.*— 14, both sexes: Matamoros, Oct. 10–Nov. 29; Montelunga, Oct. 10–April 29; San Fernando, Oct. 29; Realita, May 27–June 13; Galindo, March 15.

Troglodytes brunneicollis cahooni *Brewster.*— 9, both sexes, Galindo, March 14–26.

Nannorchilus leucogaster leucogaster (*Gould*).— 1 ♂, Altamira, Jan. 1.

CERTHIIDÆ.

Certhia familiaris albescens *Berlepsch.*— 11, both sexes: Galindo, Oct. 3–March 25; Montelunga, Oct. 11–April 27; Realito, May 23–June 10.

SITTIDÆ.

Sitta carolinensis mexicana *Nelson & Palmer.*— 1 ♂, Galindo, March 25.

PARIDÆ.

Bæolophus atricristatus atricristatus (*Cassin*).— 27, both sexes: Matamoros, Aug. 15–Nov. 25; Guiaves, Sept. 15–20; Santa Leonor Sept. 11–March 15; San Fernando, Oct. 21–25; Rio Martinez, March 3–26.

Bæolophus wollweberi wollweberi (*Bonap.*).— 21, both sexes: Rampahuila, Sept. 28–29; Yerba Burna, Sept. 29; Carricitos, Sept. 30–Oct. 14; Montelunga, Sept. 25; Galindo, Oct. 3–March 22; Guiaves, Oct. 6; Portrero, Sept. 24–Oct. 3.

Auriparus flaviceps flaviceps (*Sundevall*).— 6, both sexes: Matamoros, Aug. 23–Dec. 6.

CORVIDÆ.

Corvus mexicanus *Gmel.*— 8, both sexes: Santa Leonor, March 11–18; Rio Cruz, June 18–July 16.

Psilorhinus morio morio (*Wagler*).— 15, both sexes: Altamira, Dec. 17–Jan. 4; Santa Leonor, March 8–April 10; Rio Cruz, July 10–20; Guiaves, Sept. 15.

Remarks.— Four of the skins from Altamira approach very closely to *Psilorhinus morio fuliginosus* (Lesson) one of them being almost referable to that form, but all others from the same place (Altamira) are typical *P. morio morio.*

Xanthoura luxuosa glaucescens *Ridgway.*— 27, both sexes: Matamoros, Oct. 25–Dec. 13; San Fernando, Oct. 20–30; Rio Martinez, Feb. 26–March 3; Rio Cruz, June 1–2.

Aphelocoma sieberi couchi (*Baird*).— 17, both sexes: Carricitos, Oct. 15; Galindo, Oct. 4–March 26; Santa Leonor, Sept. 11; Realito, May 26–June 5.

LANIIDÆ.

Lanius ludovicianus excubitorides (*Swainson*).— 4, both sexes: Matamoros, Nov. 24–30; San Fernando, Oct. 24.

VIREONIDÆ.

Vireosylva olivacea (*Linn.*).— 1 ♂, Matamoros, Aug. 21.

Vireosylva gilva swainsoni (*Baird*).— 5, both sexes, Galindo, March 14–27.

Lanivireo flavifrons (*Vieillot*).— 1 ♂, Matamoros, Aug. 25.

Lanivireo solitarius solitarius (*Wilson*).— 10, both sexes: Galindo, Oct. 2; Guiaves, Sept. 17; San Fernando, Oct. 25; Montelunga, Oct. 11–April 27; Realito, May 30–June 6.

Remarks.— There are four breeding birds from Realito, May 30–June 6, and two from Montelunga, April 26–27. These are very close to northern specimens of true *solitarius*, though they differ slightly in the line of demarcation between the colors of the head and back being rather more sharply drawn, and the head slightly bluer. On the whole, however, we are surprised to find these local birds, breeding in the mountains of eastern Mexico so very close to migrants and northern examples. Four breeding males have a wing average of 72.5, while two breeding females have a wing average of 73.

Vireo atricapillus *Woodhouse*.— 1 ♂, Santa Leonor, April 12.

Vireo griseus griseus (*Boddaert*).— 4 ♂: San Fernando, Oct. 10; Altamira, Dec. 10–14.

Remarks.— These are wholly referable to the northern bird both in color and size.

Vireo griseus micrus (*Nelson*).— 30, both sexes: Matamoros, Aug. 20–Dec. 6; San Fernando, Sept. 16–Oct. 30; Guiaves, Sept. 14–21; Rio Santa, Sept. 8; Caballeros, Sept. 7; Santa Leonor, Sept. 11–April 2; Rio Martinez, March 3; Rio Cruz; Sept. 10; Altamira, Dec. 11–12.

Remarks.— In this large series the wing runs very constantly from 54 to 58 mm. Most of the specimens are extreme of this small, dull colored race, and have been so pronounced by Mr. Nelson, who examined some of them. A few, however, are not quite typical and may have migrated from an intermediate region.

Vireo huttoni mexicanus *Ridgway*.— 7: Yerba Buena, Sept. 29; Galindo, Oct. 4–March 27; Rampahuila, Sept. 28.

Vireo belli belli *Aud.*— 8: Guiaves, Sept. 18–22; Galindo, Oct. 5; Caballeros, Sept. 6; Rio Santa, Sept. 8.

HIRUNDINIDÆ.

Riparia riparia (*Linn.*).— 4, both sexes, Matamoros, Aug. 21–29.

Cheledon[1] **erythrogastra** (*Boddaert*).— 3 ♂, Matamoros, Aug. 18–Sept. 2.

MOTACILLIDÆ.

Anthus rubescens (*Tunstall*).— 4, both sexes: Matamoros, Nov. 27–30; Altamira, Dec. 14.

Anthus spraguei (*Aud.*).— 6, both sexes, Matamoros, Nov. 27–30.

MNIOTILTIDÆ.

Mniotilta varia (*Linn.*).— 12, both sexes: Matamoros, Aug. 21–Nov. 27; Altamira, Dec. 12; Guiaves, Sept. 18; Galindo, March 23–25.

Helinaia swainsoni *Aud.*— 1 ♀, Matamoros, Aug. 29.

Helmitheros vermivorus (*Gmel.*).— 1 ♂, Matamoros, Aug. 22.

Vermivora pinus (*Linn.*).— 1 ♂, Matamoros, Aug. 25.

Vermivora celata celata (*Say*).— 31, both sexes: Matamoros, Oct. 30–Dec. 6; Altamira, Dec. 10–12; San Fernando, Oct. 21–29; Galindo, March 25.

Remarks.— Some of these specimens may have come from an intermediate breeding ground, though none are quite referable to *V. c. lutescens.*

Vermivora rubricapilla rubricapilla (*Wilson*).— 9, both sexes: Matamoros, Oct. 11–Nov. 28; San Fernando, Oct. 19–22; Galindo, March 13–15; Rio Martinez, March 2; Montelunga, April 27.

Oreothlypis superciliosa (*Hartlaub*).— 24, both sexes: Rampahuila, Sept. 28; Montelunga, Sept. 25; Galindo, March 14–26; Realito, May 31–June 11.

Compsothlypis americana ramalinæ *Ridgway.*— 2, both sexes: Matamoros, Aug. 22; Altamira, Dec. 16.

Remarks.— Both these specimens appear to be referable to this subspecies.

Compsothlypis pitiayumi nigrilora (*Coues*).— 19, both sexes: Matamoros, Aug. 22; Altamira, Dec. 11–24; Caballeros, Sept. 6; Santa Leonor, Sept. 11–April 16; Guiaves, Sept. 20; Rio Cruz, May 7–June 8; Montelunga, April 27–30.

Peucedramus olivaceus (*Giraud*).— 8, both sexes: Montelunga, Oct. 11–April 27; Galindo, Oct. 4–March 25; Yerba Burna, Sept. 29; Realito, May 22–26.

Dendroica æstiva æstiva (*Gmel.*).— 4, both sexes: Rio Cruz, May 10; Guiaves, Sept. 14–19.

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[1] Cf. Hartert, Die Vögel der Paläarktischen Fauna, VI, June, 1910, p. 799.

Dendroica æstiva ineditus subsp. nov.

14, both sexes: Matamoros, Aug. 15–Sept. 3.

Type from Matamoros, Tamaulipas, Mexico; No. 49970, Mus. Comp. Zoöl. Adult ♂, collected Aug. 19, 1908, by F. B. Armstrong.

Characters.— Most nearly like *D. æ. dugesi* Coale, but slightly smaller, and the female very different in color, being bright yellow below, and dull greenish yellow above instead of grayish. Also somewhat similar to *D. æ. sonorana* Brewster in general coloration of the male, but much larger, and the female more brightly colored — yellower below and more greenish above.

This form, which probably occupies the whole coast region of northern Tamaulipas up to the Rio Grande Valley of Texas is strikingly different from the other geographical races of *D. æstiva*. It is at once distinguished from *D. æstiva æstiva* by larger size, duller and more yellowish coloration, with the crown of the male always dull yellow and the back always unstriped. It is larger than *D. æ. sonorana*, of western Mexico, and slightly different in color, especially the female. It is only slightly smaller than *D. æ. dugesi*, which form it also most nearly resembles in coloration, the males of the two being very nearly alike. The female, however, is wholly different from the female of *D. æ. dugesi* in color, being hardly distinguishable in this respect from the female of *D. æstiva æstiva*, from which its greater size separates it at once.

No.	Sex.	Wing.	Tail.	Tarsus.	Culmen.
49970	♂	65	45	18	9
49971	♂	65	45	18	11
49977	♂	66	47	18	10
49978	♂	65	44	18	10
49974	♂	62	45	17	10
49973	♂	64	44	16	10
49972	♂	63	45	18	11
49976	♂	63	47	18	10
49975	♂	62	43	17	10
49979	♀	60	43	18	10
49981	♀	61	44	17	10
49980	♀	61	42	17	10
A	♂	64	44	17	10
B	♀	59	44	17	10

Dendroica coronata (*Linn.*).— 12, both sexes: Matamoros, Nov. 10–Dec. 5; Altamira, Dec. 12–15; Galindo, March 15–23.

Dendroica auduboni auduboni (*Townsend*).— 9, both sexes: Matamoros, Dec. 1; San Fernando, Oct. 22; Galindo, March 14–23.

Dendroica townsendi (*Townsend*).— 2, both sexes, Montelunga Oct. 10 and April 30.

Dendroica virens (*Gmel.*).— 23, both sexes: San Fernando, Oct. 25–26; Altamira, Dec. 14–31; Galindo, March 14–April 19; Santa Leonor, March 10–April 14; Montelunga, April 26–28.

Dendroica chrysoparia *Sclater & Salvin.*— 3, both sexes, Galindo, March 14–22.

Dendroica occidentalis (*Townsend*).— 2, both sexes: Guiaves, Oct. 7; Galindo, March 19.

Dendroica dominica albilora *Ridgway.*— 1 ♂, Guiaves, Sept. 18.

Remarks.— This specimen is not quite typical, having too large a bill, and the character of the outer tail feathers about intermediate between *D. d. dominica* and *D. d. albilora.*

Oporornis formosa (*Wilson*).— 3, both sexes, Matamoros, Aug. 26–Sept. 2.

Oporornis philadelphia (*Wilson*).— 11, both sexes: Matamoros, Aug. 16–31; Guiaves, Sept. 22.

Oporornis tolmiei (*Townsend*).— 1 ♂, Rio Cruz, May 12.

Seiurus aurocapillus (*Linn.*)— 2, both sexes: San Fernando, Oct. 28; Montelunga, April 26.

Seiurus motacilla (*Vieillot*).— 1 ♂, Guiaves, Sept. 18.

Geothlypis trichas brachidactyla (*Swainson*).— 21, both sexes: Matamoros, Aug. 14–27 and Nov. 23, including one ♀ still in nestling plumage (Aug. 14); San Fernando, Oct. 30–31; Altamira, Dec. 11–15; Rio Cruz, May 6–12.

Remarks.— If true *G. trichas* and *G. trichas brachidactyla* are kept distinct as was done by Ridgway, these skins will all go rather better with *brachidactyla.*

Icteria virens virens (*Linn.*).— 12, both sexes: Matamoros, Aug. 10–Sept. 3; Rampahuila, Sept. 26; Caballeros, Sept. 6; Altamira, Dec. 12.

Wilsonia pusilla pusilla (*Wilson*).— 5, both sexes: Rio Santa, Sept. 8; Matamoros, Aug. 31; Guiaves, Sept. 14–20; Altamira, Dec. 12.

Wilsonia pusilla pileolata (*Pallas*).— 25, both sexes: Guiaves, Sept. 12–18; Rio Martinez, Sept. 9–Feb. 24; Altamira, Dec. 11–Jan. 1; Galindo, March 18–25; Santa Leonor, March 8–9; Rio Cruz, Jan. 20–July 22.

Wilsonia canadensis (*Linn.*).— 11, both sexes; Matamoros, Aug. 19–Sept. 1.

Setophaga picta picta (*Swainson*).— 12, both sexes: Rampahuila, Sept. 26–27; Portrero, Sept. 24; Rio Martinez, Feb. 27; Galindo, March 15–23; Realito, May 23–June 3.

Euthlypis lachrymosa lachrymosa *Cabanis.*— 1 ♂, Santa Leonor, April 3.

Basileuterus belli belli (*Giraud*).— 6, both sexes: Montelunga, Oct. 11; Rampahuila, Sept. 26; Carricitos, Oct. 14; Galindo, Oct. 1.

Basileuterus rufifrons jouyi *Ridgway.*— 43, both sexes: Galindo, Oct. 1–March 23; Guiaves, Sept. 25–Oct. 8; Montelunga, Sept. 25–Oct. 13; Yerba Burna, Sept. 29–30; Rampahuila, Sept. 26–28; Santa Leonor, March 7–April 7; Rio Cruz, June 15–July 20.

Basileuterus culicivorus brasheri (*Giraud*).— 54, both sexes: Santa Leonor, Sept. 12–April 11; Caballeros, Sept. 6–7; Guiaves, Sept. 17–22; Rio Martinez, March 1; Rio Cruz, June 19–July 17.

ICTERIDÆ.

Molothrus ater ater (*Boddaert*).— 2 ♀, Matamoros, Nov. 26.

Remarks.— Typical of the eastern race.

Megaquiscalus major macrourus (*Swainson*).— 4 ♂, Matamoros, Nov. 17–21.

Icterus melanocephalus auduboni (*Giraud*).— 15, both sexes: Galindo, Oct. 2–4; San Fernando, Oct. 19; Altamira, Jan. 1; Rio Martinez, March 1–Feb. 27; Santa Leonor, April 1; Rio Cruz, June 27–July 7; Realito, June 7–13.

Icterus gularis tamaulipensis *Ridgway*.— 11, both sexes: Altamira, Dec. 8–24; Santa Leonor, Sept. 12; Guiaves, Sept. 15.

Icterus cucullatus sennetti *Ridgway*.— 3, both sexes, Matamoros, Aug. 24–29.

Icterus galbula (*Linn.*).— 4, both sexes: Santa Leonor, Sept. 11–13; Galindo, Oct. 1; Guiaves, Sept. 17.

Icterus bullocki (*Swainson*).— 5, both sexes: Guiaves, Sept. 16–Oct. 6; Galindo, Oct. 4; Yerba Burna, Sept. 30; Montelunga, April 27.

Agelaius phœniceus richmondi *Nelson*.— 18, both sexes: Matamoros, Aug. 23–Nov. 28; San Fernando, Oct. 20–25.

Sturnella neglecta *Aud*.— 4 ♀, Matamoros, Nov. 19–25.

TANGARIDÆ.

Piranga rubra rubra (*Linn.*).— 5, both sexes: Matamoros, Aug. 26–27; Carricitos, Oct. 15; Rio Martinez, Feb. 24; Galindo, April 20.

Piranga hepatica dextra *Bangs*.— 36, both sexes: Matamoros, Nov. 9; Rampahuila, Sept. 26–28; Galindo, Oct. 1–March 26; Carricitos, Oct. 15; Montelunga, Oct. 12; Realito, May 22–June 8.

Piranga bidentata sanguinolenta (*Lafr.*).— 21, both sexes: Galindo, March 15–25; Realito, April 20–June 13; Montelunga, April 31.

FRINGILLIDÆ.

Loxia curvirostra stricklandi *Ridgway*.— 2 ♂, Galindo, March 20–27.

Spinus pinus pinus (*Wilson*).— 5, both sexes, Galindo, March 15–April 29.

Astragalinus tristis pallidus (*Mearns*).— 1 ♂, Santa Leonor, March 9.

Astragalinus psaltria psaltria (*Say*).— 9, both sexes (one young ♀, Galindo, Oct. 1, has no white whatever on the tail; another young ♀ has only a trace of it): Galindo, Oct. 1; Rampahuila, Sept. 26–28; Yerba

Burna, Sept. 29–30; Guiaves, Oct. 7; Montelunga, Oct. 13; Rio Martinez, March 4.

Passer domesticus (*Linn.*).— 1 ♀, Matamoros, Aug. 17.

Calamospiza melanocorys *Stejneger*.— 3 ♂, Matamoros, Nov. 27–Dec. 1.

Spiza americana (*Gmel.*).— 5, both sexes, Matamoros, Aug. 18–26.

Chondestes grammacus strigatus (*Swainson*).— 12, both sexes. Matamoros, Aug. 28–Dec. 4; San Fernando, Oct. 16; Montelunga, April 26; Rio Cruz, July 1.

Pocecetes gramineus gramineus (*Gmel.*).— 3, both sexes, Matamoros, Nov. 5–Dec. 2.

Passerculus sandwichensis savanna (*Wilson*).— 6, both sexes: Matamoros, Nov. 7–20.

Remarks.— These specimens comprise a rather puzzling series, with some probable intermediates.

Passerculus sandwichensis alaudinus (*Bonaparte*).— 8, both sexes: Matamoros, Nov. 7–Dec. 3; Altamira, Dec. 15; San Fernando, Oct. 25.

Ammodramus savannarum australis *Maynard*.— 2 ♂: Altamira, Dec. 12; Galindo, March 17.

Aimophila ruficeps eremœca (*Brown*).— 3 ♂, Guiaves, Oct. 7–9.

Aimophila ruficeps boucardi (*Sclater*).— 23, both sexes, young and adults: Rampahuila, Sept. 26–28; Carricitos, Oct. 15; Guiaves, Oct. 6–9; Montelunga, Oct. 10–April 29; Yerba Burna, Sept. 30; Galindo, March 15–April 18; Realito, May 22–June 6.

Remarks.— Most of the specimens listed above are typical of *boucardi* though some few appear to be somewhat intermediate between this and *eremœca*.

Aimophila cassini (*Woodhouse*).— 8, both sexes: Matamoros, Aug. 17–Nov. 25.

Aimophila botterii botterii (*Sclater*).— 9, both sexes: Matamoros, Aug. 13–Sept. 13.

Amphispiza bilineata bilineata (*Cassin*).— 25, both sexes: Matamoros, Aug. 18–Dec. 5; San Fernando, Aug. 24–27.

Junco phæonotus phæonotus *Wagler*.— 3, both sexes: Galindo, March 20–27.

Spizella passerina arizonæ *Coues*.— 30, both sexes: Santa Leonor, April 4; Montelunga, April 27; Galindo, March 14–April 19.

Remarks.— Most of these skins are typical of this form, though a few somewhat approach *mexicana*, none, however, being quite referable to it.

Spizella pusilla arenacea *Chadbourne*.— 5 ♂, Matamoros, Nov. 9–Dec. 3.

Spizella pallida (*Swainson*).— 10, both sexes: Matamoros, Nov. 4–Dec. 1; San Fernando, Oct. 30.

Zonotrichia leucophrys leucophrys (*Forster*).— 12, both sexes, Matamoros, Nov. 4–Dec. 1.

Zonotrichia leucophrys gambeli (*Nuttall*).— 1 ♂, Matamoros, Nov. 25.

Melospiza lincolni lincolni (*Aud.*).— 20, both sexes: San Fernando, Oct. 22–30; Altamira, Dec. 17–18; Matamoros, Nov. 20–27; Galindo, March 14–29; Santa Leonor, March 8–April 14.

Pipilo maculatus montanus *Swarth.*— 1 ♂, Galindo, March 15.

Arremonops rufivirgatus rufivirgatus (*Lawrence*).— 32, both sexes: Matamoros, Aug. 21–Dec. 1; Guiaves, Sept. 14–21; Rio Cruz, Sept. 10–July 7; Rio Santa, Sept. 8; San Fernando, Oct. 30; Caballeros, Sept. 7; Altamira, Dec. 10–15; Rio Martinez, Feb. 24–March 4.

Atlapetes pileatus dilutus *Ridgway.*— 37, both sexes: Guiaves, Oct. 6–8; Montelunga, Oct. 12; Yerba Burna, Sept. 29; Carricitos, Oct. 15–16; Galindo, Oct. 3–March 26; Portrero, Sept. 24; Rampahuila, Sept. 28; Realito, May 23–June 2.

Sporophila morelleti sharpei *Lawrence.*— 8, both sexes: Matamoros, Aug. 21–Nov. 24; Altamira, Dec. 17.

Passerina cyanea (*Linn.*).— 2 ♀, San Fernando, Oct. 21–23.

Passerina ciris (*Linn.*).— 4, both sexes: Matamoros, Aug. 24–25; San Fernando, Oct. 27; Altamira, Dec. 15.

Passerina versicolor versicolor (*Bonap.*).— 6, females and young males: Matamoros, Aug. 23–27; Guiaves, Sept. 16–Oct. 7.

Cyanocompsa parellina parellina (*Bonap.*).— 26, both sexes: Guiaves, Sept. 20–April 31: Carricitos, Oct. 15; Rio Martinez, Feb. 24; Rio Cruz, Jan. 20–July 1; Altamira, Dec. 10–Jan. 1; Santa Leonor, March 10–April 12.

Guiraca cærulea cærulea (*Linn.*).— 2 ♀, Montelunga, Oct. 10; Rio Cruz, July 8.

Zamelodia melanocephala (*Swainson*).— 1 ♀, Galindo, March 14.

Pyrrhuloxia sinuata texana *Ridgway.*— 9, both sexes: Matamoros, Nov. 3, Dec. 3–Feb. 24.

Cardinalis cardinalis canicaudus *Chapman.*— 38, both sexes: San Fernando, Oct. 20–23; Matamoros, Nov. 3–26; Altamira, Dec. 12–24; Rio Martinez, Feb. 25–March 5; Santa Leonor, March 7–April 15; Rio Cruz, June 23–26.

Remarks.— In 'Birds of North and Middle America' Ridgway gives the range of *C. cardinalis coccineus* as extending north to Altamira. Five skins, one female and four males from Altamira in the above series are, however, distinctly referable to *C. cardinalis canicaudus*, the females having the same pale, grayish capistrum, and a small bill, very different from the deep black capistrum and heavy bill of *coccineus*.

The males approach *coccineus* somewhat in the color of the back, the gray edging to the feathers being more reduced than in northern specimens, but otherwise, in their small bills and the color of the underparts, they are similar to skins from Matamoros and other northern points in Tamaulipas.

Rhodothraupis celæno (*Licht.*). 17, both sexes: Rio Santa, Sept. 8; Yerba Burna, Sept. 30; Rio Martinez, Feb. 23–26; Santa Leonor, March 7–April 15; Rio Cruz, May 1–July 10; Guiaves, May 4

CONCERNING THE NUPTIAL PLUMES WORN BY CERTAIN BITTERNS AND THE MANNER IN WHICH THEY ARE DISPLAYED.

BY WILLIAM BREWSTER.

CHIEF among the natural attractions of Concord, Massachusetts, is its charming little river, known as the Sudbury above the point where, near the village center, it unites with the Assabet, and below this as the Concord. The Indians called it the Musketequid or Grass-grown River, a name not less appropriate than euphonious, for its sluggish waters abound in aquatic or semi-aquatic vegetation and its banks are fringed with wild grasses and sedges which stretch for miles along one or both sides of the placid, sinuous stream and in places also extend back to a greater or less distance over low, flat lands wet at all seasons and regularly inundated in early spring. These fresh-water marshes are of vast extent in Sudbury and Wayland and they cover hundreds of acres in the eastern part of Concord where they have been known, ever since the first settlement of the town, as the Great Meadows and where I am especially familiar with them for I am accustomed to spend much time in spring and autumn at a camp on Ball's Hill that directly overlooks them. Among the birds which frequent them at these seasons and in summer, the American Bittern is one of the commonest and most conspicuous as well as most interesting. I have had so many opportunities of watching it here and elsewhere that I had come to doubt if there could be anything more of importance for me to learn regarding its life history when, only last April, I was not a little surprised — and also a bit humiliated — to find that during the mating season the male bird indulges in certain odd and interesting displays of plumage of which I had been wholly ignorant. The following account of this experience is taken, with few changes, from my journal where I wrote it out in full just after making the observations to which it relates.

Concord, Massachusetts. April 17, 1910. Brilliantly clear and bracingly cool with strong, keen east wind.

The marsh on the south side of the river opposite Ball's Hill looks, at present, almost as smooth and verdant as a well kept lawn. It was mown over late last summer and having been free from flood water for upwards of a month past, is now covered everywhere with young grass three or four inches in height. Although this affords no concealment for birds larger than a Snipe the marsh has been frequented much of late by Bitterns. At morning and evening I have heard them pumping or have seen them flying to and fro, or standing erect with heads and necks stretched up on the watch for danger, but previous to to-day I have paid little attention to them. Two which I saw this morning, however, presented such a strange appearance and acted in so remarkable a manner that I watched them for half-an-hour or more with absorbing interest. When I first noticed them they were on the further margin of a little lagoon where Red-winged Blackbirds breed, moving past it eastward almost if not quite as fast as a man habitually walks, one following directly behind the other at a distance of fifteen or twenty yards. Thus they advanced, not only rapidly but also very evenly, with a smooth, continuous, gliding motion which reminded me of that of certain Gallinaceous birds and was distinctly un-heron-like. Occasionally they would stop and stand erect for a moment but when walking they invariably maintained a crouching attitude, with the back strongly arched, the belly almost touching the ground, the neck so shortened that the lowered head and bill seemed to project only a few inches beyond the breast. In general shape and carriage, as well as in gait, they resembled Pheasants or Grouse much more than Herons. But the strangest thing of all was that both birds showed extensive patches of what *seemed to be pure white* on their backs, between the shoulders. This made them highly conspicuous and led me to conclude at first that they must be something quite new to me and probably — because of their attitudes and swift, gliding movements — Pheasants of some species with which I was unfamiliar. Thus far I had been forced to view them with unassisted eyesight, but when I had reached the cabin and they the edge of our boat canal directly opposite it I got my opera glass and by its aid quickly convinced myself that despite their unusual behavior and the white on their backs they could be nothing else than Bitterns.

I was now joined by Miss E. R. Simmons, Miss Alice Eastwood (the California botanist) and my assistant Mr. R. A. Gilbert, all of whom became at once deeply interested in the birds which had stopped and were standing erect by the canal about twenty yards apart. Suddenly both rose and flew straight at one another, meeting in the air at a height of four or five feet above the marsh. It was difficult to make out just what happened immediately after this but we all thought that the birds came together with the full momentum of rapid flight and then, clinching in some way, apparently with both feet and bills, rose six or eight feet higher, mounting straight upward and whirling around and around, finally descending nearly to the ground. Just before reaching it they separated and sailed (not flapped) off to their former respective stations. After resting there a few minutes the mutual attack was renewed in precisely the same manner as at first only somewhat less vigorously. It was not repeated after this. Although a most spirited tilt (especially on the first occasion), by antagonists armed with formidable weapons (the dagger-like bills), we could not see that any harm resulted from it to either bird. When we crossed the river in a boat some fifteen minutes later both Bitterns were still standing near the canal. Up to this time both had shown the white continuously but it *disappeared* as we were approaching them. One took flight when we were in the middle of the river. We got within twenty yards of the other before it moved and then it merely walked off over the marsh.

Concord, April 18, 1910. Cloudy with fine, steady rain. Forenoon cool with chill east wind; afternoon warm with light south wind.

A close watch was kept for the Bitterns during the forenoon but nothing was seen of them until afternoon when, about two o'clock, both birds appeared in the marsh on the eastern side of the canal. Mr. H. A. Purdie was now with me. He, Gilbert and I had the Bitterns under observation for more than an hour. During this time they rambled about over several acres of the lawn-like marsh keeping, for the most part, however, near the edge of the river here about one hundred and fifty yards in width. They indulged in no tilting on this occasion nor once approached each other nearer than thirty yards while not infrequently they were more than twice that distance apart. As was the case yesterday they carried their bodies very low and at times so flattened to the ground that they resembled big, swift-crawling tortoises rather than birds, as they wound in and out among the tufts of grass for on this occasion they pursued devious courses which usually ended near the starting point. They did not seem to be looking for food but rather to be inspired by restlessness and also by a spirit of rivalry. As both "pumped" at frequent intervals I concluded that both must be males. There was much connected with their behavior which suggested that they were chiefly engaged in "showing off" apparently to each other, solely, for if there was a female anywhere near at hand we failed to see her. Whenever one of them "pumped" the other was sure to respond within two or three seconds, sometimes facing his rival, sometimes turning in another direction. During most of the time when they were in the marsh together both birds showed the white which we saw yesterday but when one of them finally flew away the other ceased altogether to display it although we had him in view for some twenty minutes longer during which time he "pumped" repeatedly. The white was seen much better and for a longer period to-day than yesterday and I was able to check, as well as supplement, my own observations by those of Purdie and Gilbert both of whom were with me the whole time and paying equally critical attention to the matter. At first we disagreed with respect to certain minor details but all such difference of opinion was finally harmonized and what I am about to record is now subscribed to by all three of us.

The white first appears at or very near the shoulders of the folded wings and then expands, sometimes rather quickly (never abruptly, however) but oftener very slowly until, spreading simultaneously from both sides, it forms two ruffs apparently almost if not quite equal in length and breadth to the hands of a large man but in shape more nearly resembling the wings of a grouse or quail held with the tips pointing sometimes nearly straight upward, sometimes more or less backward, also. As they rise above the shoulders these ruffs spread toward each other at right angles to the long axis of the bird's body until, at their bases, they nearly meet in the centre of the back. Sometimes they are held thus without apparent change of area or position for many minutes at a time, during which the bird may move about over a considerable space or perhaps merely stand or crouch in the same place. We frequently saw them fully displayed when the Bitterns were "pumping" but not then more conspicuously, or in any different way, then than at other times. When the bird was moving straight towards us with his body carried low and his ruffs fully expanded he looked like a big, white rooster having only the head and breast dark colored, the breast often looking nearly black. For in this aspect and at the distance at which we viewed him (perhaps two hundred yards) the broad ruffs, rising above and reaching well out on both sides of the back and shoulders, completely masked everything at their rear while the head and the shortened neck, being carried so low that they were seen only against the breast, added little or nothing to the visible area of dark plumage. When he was moving away from us in the same crouching attitude the ruffs looked exactly like two white wings — nearly as broad as those of a domestic Pigeon but less long — attached to either side of the back just above the shoulders. When we had a side view of him the outline of the ruffs was completely lost and there seemed to be a band of white as broad as one's hand, extending between the shoulders quite across the back. Thus whichever way he moved or faced the white was always shown, most conspicuously, however, when he turned towards us. It did not ever look dull or faint, or even yellowish, whether seen in bright sunlight, as on the morning of the 17th, or under dark lowering skies, as on the afternoon of the 18th. On the contrary, at all times and under all conditions, when we saw it at all, it appeared to be *pure* white. When the Bittern was rambling through short, rich-green grass or over blackish mud, the white was often the only thing we could see. It made an odd impression on the mind as it moved about without visible means of propulsion and had we not known just what it was we should certainly have been sorely puzzled to account for it. When the bird was standing or crouching motionless the white might easily have been mistaken for a small patch of snow or for a good-sized sheet of writing paper lying in the marsh. It was so very conspicuous that anyone looking out casually over the marsh could not have failed to notice it at the first glance. As

I have said it opened out rather slowly as a rule and never very abruptly. Its disappearance was effected in a correspondingly deliberate manner.

On reaching home late this afternoon I at once examined all the Bitterns in my collection. Most of them are females or males killed in autumn, none of which have pronounced white or whitish anywhere about the wings. But four adult males taken in spring possess tufts of yellowish white feathers, soft and more or less downy in texture, which are attached to the sides of the breast under the shoulders. By erecting and spreading these feathers I have been able to produce something resembling what we saw in Concord. The Concord birds, however, apparently had plumes *more than double* the size of those possessed by any of my skins and pure, not yellowish, white. When I gave an account of the matter at a meeting of the Nuttall Club this evening one of the members (Mr. Freeman) suggested that the Bittern may inflate the skin to which the plumes are attached, thus causing them to stand out further than they can be made to do in the dried skin. Even if this be so I doubt if feathers no longer or more numerous than those of my specimens could expand into the broad, full, snowy ruffs shown by the Bitterns seen yesterday and today at Concord. It is conceivable, of course, that the ruffs displayed by the living birds were less large and white than they appeared. I should suspect that this may have been the case were it not that the observations I have just noted were made with care by *five different persons* and under widely varying conditions of light and shade. Hence I have felt justified in recording our mutual impressions of what we saw despite the fact that my skins of Bitterns do not seem to altogether confirm them.

Concord, April 20, 1910. Clear and warm with fresh southwest wind.

I returned to Concord late this afternoon provided with a gun and determined to kill a Bittern if I could get a shot at one that showed white ruffs. Three males began pumping about six o'clock. Two of them were far out in the open meadows. The third, at the edge of the river, was accompanied by a smaller, duller plumaged bird which, without doubt, was a female and his mate. I watched this pair for more than half an hour. The male pumped at frequent intervals but showed no white. The female was within twenty yards of him most of the time and for ten or fifteen minutes within three yards. He invariably faced her and she him when he was pumping but neither bird seemed in the least moved by sexual ardor or excitement or did anything especially suggestive of courtship. Indeed both behaved quite after the usual manner of their kind and altogether differently from the Bitterns seen on the 17th and 18th. When they walked it was with dignified slowness, carrying themselves rather erect and lifting and putting down their feet with marked deliberation. They crouched a few times over a pool of water remaining there for many minutes, evidently on the watch for prey, in poses closely similar to those assumed by Night Herons and Great Blue Herons when similarly engaged. Once the female plunged her head under water and drew out something which she first shook violently and then swallowed. Very much of the time she stood motionless with her bill pointing straight upward, her neck elongated and her body plumage so compressed that head, neck and body appeared all of about the same thickness and not much stouter than a man's wrist. When in this attitude she looked almost exactly like a stake, a yard or so in length, rising straight out of the marsh and of a weathered grayish color. The male did precisely the same thing but less often and for shorter periods. It was evident that both birds were apprehensive of danger of some kind and almost constantly on the watch for it. Indeed they seemed even more alert and suspicious than the Great Blue Heron or the Great White Egret often does, when seen under similar conditions. I was somewhat surprised at this and altogether delighted by their wonderful grace of form and movement. During the time I had them under observation they moved onward in a nearly straight course along the edge of the river but so very slowly that the total distance covered was less than forty yards. At length the male rose and flew down river two or three hundred yards. Although he pumped a number of times in this new station the female did not follow him.

Concord, April 21, 1910. Sunny but hazy; forenoon calm; fresh east wind in afternoon.

I spent almost the entire day watching Bitterns. There were two males pumping in the Great Meadows, sometimes within fifty yards of one another, sometimes two hundred to three hundred yards apart. Whenever they approached one another they acted like the two seen on the 17th and 18th, crawling or gliding about over the meadow and showing their ruffs more or less constantly and conspicuously. One appeared to have small, yellowish ruffs, the other large, pure white ones. I tried in vain to get a shot at them. It was simply impossible to stalk them for there was no cover of any kind and they would not permit me to approach them nearer than one hundred yards before taking wing. They never once attempted to hide but merely stood looking at me until they thought I was getting dangerously close when they would fly to a distant part of the meadow, returnimg to their original stations whenever I went back to my canoe.

Among the members of the Nuttall Club present at the meeting when I gave an account of some of the observations above described was my friend and neighbor Mr. Charles R. Lamb. Shortly afterwards he visited Cape Cod to obtain a few shore birds for his collection. During this trip he had an opportunity of seeing a Bittern display its white ruffs and of examining them just after the bird was killed. He has since been kind enough to place at my disposal his written notes relating to this experience. Their testimony is, in part, as follows:—

"Late in the afternoon" of May 27, 1910, Mr. Lamb was sitting in a shooting stand in a marsh at East Orleans, Massachusetts, when he noticed a Bittern "about 100 to 150 yards" away, "standing very erect, with bill pointed up, looking like a stick." Shortly after this it "lowered the feathers of the neck, bent the neck a little and started to walk off, at the same time throwing out the white feathers at the shoulder, over the wing. These feathers stood out straight from the body at first, then seemed to extend backward," being "apparently all white" and forming "a conspicuous wing-shaped thing on the back above the wing, which looked about the size of" one's "hand, possibly not quite as long." As no other Bittern was in sight Mr. Lamb "could see no reason for the display of the white feathers unless it was due" to apprehension or alarm caused by his own presence. After watching the bird for several minutes he approached it by crawling on hands and knees through the grass and shot it, just as it took wing.

He "did not feel sure it was a Bittern until it flew" for its general coloring, "as seen through the glasses, looked dark bluish instead of brown." On examining this specimen just after killing it he found that the white feathers "appeared" to be attached "at the point where" the humerus enters "the body and as near the back as the breast." They "could easily be thrown out above the wing which was evidently done" by the living bird. On each side of the breast there were "about eight pure white feathers of a downy or fluffy quality and two or more nearly all white but with some brown near the shafts." This Bittern proved, on dissection, to be a male.

Since the above notes were made I have examined upwards of fifty skins of the American Bittern preserved in collections other than my own. On the strength of this and previous investigation I base the following generalizations respecting the light colored tufts of feathers which — for lack of a better name — I have called ruffs. (1) They are, as has been said, attached to the skin on each side of the breast near where the humerus enters the body and beneath the shoulder of the folded wing by which they are ordinarily concealed. (2) They are soft and fluffy in character and on the whole more nearly like down than like ordinary contour plumage although they often include typical feathers, rather large and well developed. (3) They vary in color from creamy white to light buffy or yellowish; the larger and broader feathers are commonly plain like the rest but sometimes they have narrow shaft stripes of rich reddish brown. (4) Although usually present in adult males killed in April, May or June they are entirely wanting or but very slightly developed in a few such birds — representing perhaps ten per cent of those which I have seen. (5) Autumnal specimens of both sexes and apparently all ages are almost, if not quite, invariably without them. (6) I have seen only one female (a breeding bird) which showed any traces (and these but slight) of them.

Concealed tufts of light-colored, downy plumage, similar in character and position to those just described and probably used in much the same manner for purposes of display, are worn by fully mature males of the South American Bittern, *Botaurus pinnatus*. Two specimens of this species in the Museum of Comparative

Zoölogy have them pure white and better developed than in any example of *B. lentiginosus* that I have ever seen. They are less conspicuous and decidedly yellowish in a third bird belonging to the National Museum. I have failed to find obvious traces of them in the European Bittern (*B. stellaris*) but that may be merely because I have thus far seen no male of this species which was certainly adult and in full nuptial plumage. An allied species, the *Botaurus pœciloptilus* of Australia, New Caledonia and New Zealand, has hidden tufts of plumes situated like those of the American birds but made up more largely of true and fully developed feathers (there are downy ones also), yellowish brown in color with conspicuous darker markings. Whether or not these feathers are ever shown in the form of ruffs must remain doubtful until some one has settled the point by watching the living bird. I have found them only in what appear to be adult males, of which I have seen four or five.

When, in November last, extracts from the present paper were read by me at the meeting of the American Ornithologists' Union in Washington I was not aware that the possession, by the male Bittern, of white plumes ordinarily concealed but sometimes conspicuously shown in the form of ruffs had ever attracted the attention of any one prior to the time (April, 1910) when my observations were made at Concord. At the close of this meeting, however, Mr. Francis Harper (who attended it) informed me that he had seen a Bittern showing white some five years previous to the date of our conversation. He has since written me that he is "very sorry to find" that he has preserved only "exceedingly fragmentary" notes relating to his experience. It happened he states "in the Ithaca marshes," New York, "on May 11, 1905," when he "observed a most strange-looking Bittern with what appeared to be two white shoulder patches joined by a narrow strip over the back. The bird was skulking about in a clump of low cattails at a distance of about a hundred yards." Its white patches "appeared roughly circular and about four or five inches in diameter." They were not seen to "change in size" nor was it noticed "that they projected from the bird's body." Mr. Harper "was inclined then to consider this as merely a case of partial albinism."

I am still further indebted to Mr. Harper for calling my attention to an article on the Bittern by Agnes M. Learned which appeared in 'Bird-Lore' for May–June, 1908 (Vol. X, No. 3, pp. 106–108) and which contains the following interesting paragraph:—

"We were surprised and delighted, and went at once to our bird books to see what the beautiful white feathers were called; but, alas, not a book mentioned them! and later research at the library failed to reveal any information. Only one spoke of them and said that Bitterns did *not* wear nuptial plumes. After much thought, we decided that the Bittern must be like its relatives, the Egrets, and wear nuptial plumes. We thought that the white feathers, or plumes, grew from the region of the scapulars; there were several on each side, and they were not over five inches long and not less than three, and were soft and downy, and with the aid of a glass we could see them flutter in the light wind."

The passage just quoted is obviously and rather curiously incomplete for it stands apart by itself with nothing of kindred character preceding or following it. Perhaps there were originally additional sentences, leading up to and explaining it, which were inadvertently left out at the last moment, either by the author or by the printer. If so their omission was unfortunate for it mars the interest and value of what appears to have been the first published description of the white nuptial plumes of the American Bittern and of the manner in which they are displayed.

TWENTY-EIGHTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Twenty-eighth Stated Meeting of the American Ornithologists' Union convened in Washington, D. C., Monday evening, November 14, 1910. The business meeting was held at 'The Cochran,' 14th and K Sts., N. W., and the public sessions in the auditorium of the new building of the U. S. National Museum, beginning Tuesday, November 15, and continuing three days.

BUSINESS SESSION.— The meeting was called to order by the President, Mr. Edward W. Nelson. Twenty-one Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 897, constituted as follows: Fellows, 49; Honorary Fellows, 12; Corresponding Fellows, 62; Members, 76; Associates, 698.

During the year the Union lost seventy-three members, six by death, twenty-two by resignation, and forty-five for non-payment of dues. The deceased members include two Honorary Fellows, and four Associates, as follows:

Henry Hillyer Giglioli,[1] of Florence, Italy, who died December 16, 1909, in the 64th year of his age, and Richard Bowdler Sharpe,[2] of London, England, who died December 25, 1909, at the age of 62 years, Honorary Fellows; also the following Associates: John Farwell Ferry,[3] who died in Chicago, Ill., February 11, 1910, at the age of 32 years; Alexander O'Driscoll Taylor,[4] who died in Newport, R. I., April 10, 1910, in the 79th year of his age; Daniel C. McEwen, of Brooklyn, N. Y., who died November 1, 1909, and Julian Montgomery Dodge, of Wenham, Mass., who died November 23, 1909.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were re-elected, as follows: Edward W. Nelson, President; Frank M. Chapman and A. K. Fisher, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, Henry W. Henshaw, Frederic A. Lucas, Chas. W. Richmond, Thomas S. Roberts, and Witmer Stone, members of the Council.

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[1] For an obituary notice, see Auk, XXVII, pp. 124–129.

[2] For an obituary notice, see Auk, XXVII, pp. 484, 485.

[3] For an obituary notice, see Auk, XXVII, pp. 240, 241.

[4] For an obituary notice, see Auk, XXVII, p. 363.

John Hooper Bowles, Santa Barbara, Cal.; E. S. Cameron, Fallon, Montana; Ned Hollister, Washington, D. C.; Waldo Lee McAtee, Washington, D. C.; and Edward Royal Warren, of Colorado Springs, Colo., were elected to the class of Members, and the following eighty-eight persons were elected Associates, namely:

Mrs. Inez B. Adams, Battle Creek, Mich.
Dr. W. W. Arnold, Colorado Springs, Colo.
Prof. G. A. Bailey, Geneseo, N. Y.
Oscar E. Baynard, Gainesville, Fla.
Albert F. Bigelow, Boston, Mass.
Merrill W. Blain, Tropico, Calif.
Edmund Bridge, West Medford, Mass.
Sidney F. Blake, Stoughton, Mass.
Robert L. Bruen, Minneapolis, Minn.
Miss Alice Bryant, Cohasset, Mass.
Eugene E. Caduc, Boston, Mass.
James Samuel Camp, Sentinel, Oklahoma.
Edward H. Christie, St. Louis, Mo.
Miss Alice F. Corey, Plainfield, N. J.
Miss Esther A. Craigmile, Hinsdale, Ill.
Miss Alice Cushman, Philadelphia, Pa.
Miss Edna H. Danielson, Goodhue, Minn.
R. J. H. De Loach, Athens, Ga.
Miss Mabel Densmore, Red Wing, Minn.
Mrs. George P. Derickson, Minneapolis, Minn.
Arthur Louis Dunham, Irvington-on-Hudson, N. Y.
Miss Eleanor P. Earle, Palma Sola, Fla.
Miss Nevada Evans, Minneapolis, Minn.
L. H. Fay, Brocton, N. Y.
Dr. George W. Field, Sharon, Mass.
W. R. Felton, Miles City, Mont.
William W. Grant, Englewood, N. J.
E. W. Graves, Long Island, Ala.
Mrs. Silas Greenwood, Winchendon, Mass.
W. L. Hahn, Washington, D. C.
Frank H. Hall, Geneva, N. Y.
Mrs. George V. H. Harper, Wilmington, Dela.
Mrs. D. H. Harrington, Orange, Mass.

Harold May Holland, Chicago, Ill.
Dr. W. F. Hutchinson, Portsmouth, Va.
Hartley H. T. Jackson, Washington, D. C.
J. M. Jessup, Washington, D. C.
Lindsey Louise Jewel, Gatun, Canal Zone, Panama.
Erwin William Johns, Tempe, Arizona.
Rev. W. R. Johnson, Killarney, Manitoba.
Mrs. Edwin R. Jump, West Newton, Mass.
Edwin R. Kalmbach, Washington, D. C.
Stanton D. Kirkham, Canandaigua, N. Y.
Joseph Kittredge, Jr., Brookline, Mass.
Louis Slidell Kohler, Bloomfield, N. J.
John Dryden Kuser, Bernardsville, N. J.
Susie Dryden Kuser, Bernardsville, N. J.
Frederick Charles Lincoln, Denver, Colo.
Clarence Harvel Luther, D. D. S., Fayetteville, Ark.
George C. Maule, Gum Tree, Chester Co., Pa.
William G. Moore, Haddonfield, N. J.
Thomas Edgar Musselman, Quincy, Ill.
Pingree I. Osburn, Pasadena, Calif.
Jesse E. Packer, Darby, Penna.
Miss Jennie M. Patten, Yuma, Colo.
Fred Albert Pennington, Chicago, Ill.
Mrs. Marian von R. Phelps, Englewood, N. J.
Gifford Pinchot, Washington, D. C.
Mrs. C. E. Raymond, Hinsdale, Ill.
James Henry Rice, Jr., Summerville, S. C.
Miss Almeda B. Robbins, Ware, Mass.
Lewis W. Robinson, Cresskill, N. J.
Dr. Fred Russell, Winchendon, Mass.
Henry E. Ryberg, New Richmond, Wisc.
Clarence Sackett, Rye, N. Y.
Edmund Joseph Sawyer, Black River, N. Y.
Waldo Schmitt, Washington, D. C.
Clarence R. Shoemaker, Washington, D. C.
George Finlay Simmons, Houston, Texas.
Miss Ethel M. Smith, Stevens, Point, Wisc.
Judge Frank Spatter, Winchendon, Mass.
Mrs. Wm. E. Strater, Louisville, Ky.
Katharine H. Stuart, Alexandria, Va.
S. Warren Sturgis, Groton, Mass.
Mrs. Graham Sumner, Englewood, N. J.
D. W. Sweet, Phillips, Maine.
Edmund H. Sweet, Sturgis, So. Dak.
Miss Grace Ellis Taft, New York, N. Y.
J. H. Taylor, Columbia, S. C.

George D. Tilley, Darien, Conn.
Miss Mary I. Tufts, Lynn, Mass.
Curtis Howe Walker, Chicago, Ill.
Ernest Pillsbury Walker, Paradox, Montrose, Co., Colo.
Edward Pearson Warner, Concord, Mass.
Oscar T. Willard, Jr., Chicago, Ill.
Miss Helen D. Wise, Washington, D. C.
Mrs. George Wood, Philadelphia, Pa.
Miss Harriet Wyman, Winchendon, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Drs. A. K. Fisher, Edgar A. Mearns, and Messrs. Frank M. Chapman and Ruthven Deane were re-appointed 'Committee on Bird Protection.'

The amendments to the By-Laws proposed at the last Stated Meeting of the Union were adopted. A new Class, known as Retired Fellows, was thus created, to consist of persons who, by their own desire and by vote of the Council, may be transferred to this Class from the Class of Fellows. They are not entitled to vote nor to hold office, but receive "The Auk" gratis.

PUBLIC SESSIONS. *First Day.*— The meeting was called to order by Vice-President Chapman. An address of welcome was made by Dr. Charles D. Walcott, Secretary of the Smithsonian Institution, on behalf of the United States National Museum.

The papers read during the morning session were as follows:

'Courtship of the American Golden-eye, or Whistler,' by William Brewster.

'Bird Strays in a Great City (New York),' by John Treadwell Nichols. Remarks followed by the Chair and Mr. Osgood.

'Nest Life of the Screech Owl,' by Miss Althea R. Sherman. Remarks followed by Mr. Coale.

Mr. Louis Agassiz Fuertes explained certain habits of Franklin's Gull as observed by him at Heron Lake, Minn.

An out-of-doors demonstration on 'Concealing Coloration' was given by Mr. Abbott H. Thayer.

The papers of the afternoon, all illustrated by lantern slides, were:

'Two Hawk Families,' by B. S. Bowdish. In the absence of the author it was read by Prof. T. G. Pearson.

'Some Rare and Interesting Birds of the Sunken Lands in Arkansas and Missouri,' by Arthur H. Howell.

'Some Experiences and Impressions of the Cowbird,' by Wilbur F. Smith.

'Some Ornithological Results of Biological Survey Field Work in 1910,' by Vernon Bailey.

'A Junco Experience,' by Wilbur F. Smith.

'Isocronal Lines of Bird Migration,' by Prof. Wells W. Cooke.

'Bird-Life on Mt. Orizaba, Mexico,' by Frank M. Chapman.

In the evening the members of the Union and their friends met at dinner at the 'Riggs House.' After the dinner an informal reception was held in the parlors of the same hotel.

Second Day.— The meeting was called to order by Vice-President Fisher. The papers of the morning session were:

'Device for the Convenient Examination of Arboreal Birds' Nests,' by William Brewster. Remarks followed by the Chair.

'Notes on the Great Auk, the Passenger Pigeon, and Eskimo Curlew,' by Edward Howe Forbush. Remarks followed by Messrs. Oldys, Bent, Brewster, and Todd, Dr. Gill and Prof. Hodge.

'The Passenger Pigeon Investigation for 1910,' by Prof. Clifton F. Hodge. Remarks followed by Messrs. Forbush, Goldman and Deane, Dr. Bartsch, and the author.

Mr. Abbott H. Thayer gave a demonstration of the concealment of color markings by definite color areas.

During the recess hour a photograph of the members of the Union was taken on the steps of the Museum building.

The following papers were presented at the afternoon session, all illustrated by lantern slides:

'Photographing Wild Birds by the Lumière Direct Color Process,' by Frank Overton, M. D. It was read, in the absence of the author, by Francis Harper.

'Flashlight and other Bird Photographs,' by Hon. George Shiras, 3d.

'Bird-Life on the Tamiahua Lagoon, Vera Cruz,' by Frank M. Chapman.

'Studies of Winter Wildfowl in Lower Louisiana,' by Rev. Herbert K. Job.

Mr. Wilfred H. Osgood showed photographs on the screen of several of the Bird Groups in the Field Museum of Natural History, Chicago.

In the evening an informal reception was given the members of the Union, and their wives, by Dr. and Mrs. C. Hart Merriam, at their home, 1919 Sixteenth St., N. W.

Third Day.— The meeting was called to order by Vice-President Chapman.

The papers of the session were:

'Overcoming Fear in Birds,' by Dr. Ned Dearborn. Illustrated by lantern slides. Remarks followed by Prof. Hodge.

'Antiphony in Bird Songs,' by Henry Oldys.

'On some Overlooked Nuptial Plumes of Certain American and Old World Bitterns,' by William Brewster. Remarks followed by the Chair and Mr. Fuertes.

The American Passenger Pigeon. Translated from the Original of Peter Kalm,' by L. M. Gronberger.

The following papers, in the absence of their authors, were read by title:

'The Color of the Gular Sac of the Water Turkey (*Anhinga anhinga*),' by Arthur T. Wayne.

'Mimesis and Rhythm in Bird Songs,' by Rev. P. B. Peabody.

'Collation of Brisson's Genera of Birds with those of Linnæus,' by Dr. J. A. Allen.

'The Extermination of the Wild Turkey in the State of Virginia,' by Dr. R. W. Shufeldt.

'List of Birds Observed in Estes Park, Colo., from June 10 to July 18, 1910,' by Otto Widmann.

Resolutions were adopted thanking the Board of Regents of the Smithsonian Institution for the use of the auditorium in the new building of the United States National Museum for a place of meeting, and for other courtesies extended; to the Local Committee and other Washington members of the Union for the cordial welcome and generous hospitality shown visiting members; and to Dr. Frank Baker, Director of the National Zoölogical Park, for his polite invitation to the members of the Union to visit the Zoölogical Park.

A resolution was passed by the Union regretting the absence from the public sessions of President Nelson, at the present time confined to his home by temporary illness.

On Friday, November 18, after adjournment of the Union, many members visited the National Zoölogical Park by invitation of Dr. Frank Baker, the Director.

The next meeting of the Union will be held in Philadelphia, the date to be determined later.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

Colymbus holbœlli in Kansas.— October 22, 1910, I captured a female Holbœll's Grebe on the Kansas River near Lawrence. The specimen, a female in winter plumage, is now in the collection of Kansas University.— LOGAN EVANS, *Lawrence, Kan.*

A Third South Carolina Record for the Man-o'-war-bird (*Fregata aquila*).— About 8 A. M. on October 19, 1910, I observed one of these birds slowly flying over my yard. At this time the wind was blowing from the northeast at the rate of forty or fifty miles an hour, accompanied with torrential rain. The bird remained in sight for fully eight minutes and finally disappeared in the direction of Sullivan's Island. It seemed to be not in the least inconvenienced by the storm that was raging, and sailed majestically in front of the severe wind with marvellous ease and upon almost motionless wings.

On October 20, 1906, between seven and eight A. M., a specimen was taken during a storm on Sullivan's Island. (See 'Birds of South Carolina,' 1910, p. 13.)

The occurrence of the Man-o'-war-bird on this coast is due entirely to cyclones or very severe storms.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Color of the Gular Sac of the Water-Turkey (*Anhinga anhinga*).— Of the numerous specimens that I have examined in nuptial plumage taken by me during the past twenty-five years the males invariably had this member deep, lustrous black, while in the females, also in nuptial plumage, it was of a lighter shade faintly mottled with yellowish.

Audubon[1] says: "Adult male....gular sac bright orange. Adult female....gular sac as in the male." Dr. Coues[2] says: "Sac orange"— evidently based on Audubon's statement.

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[1] Birds of America, VI, 1843, 452, 454.

[2] Key to North American Birds, 1892, 730.

The brain of this species is always infested with numerous cranial parasites (*Filaria anhingæ*), which are coiled up in the cerebellum. An adult male taken May 18, 1910, had ten of these parasites coiled up in the brain, while the gizzard contained great numbers of parasites. That these parasites infest the brain, as well as the gizzard, of the Water-Turkey, was pointed out by Dr. Jeffries Wyman[1] in a lengthy article as long ago as 1868. It would be exceedingly interesting to ascertain by what means these parasites are taken into the body and through what channels they make their way into the brain.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Nest of the Florida Gallinule.— In 1890 and 1891 the Florida Gallinule (*Gallinula galeata*) nested in the marsh at Branchport, N. Y., in large numbers; then several years of dry weather followed, the water receded, the ground was cultivated and the flags and reeds were replaced by crops of corn and cabbage, and in place of the Gallinules and Rails nesting in the reeds we had Spotted Sandpipers and Kildeers nesting among the corn rows.

High water came again in the spring of 1901 and the flats have been flooded each spring since until the marsh has gradually come back to her own with cat-tails, rushes, swamp grass and water lilies, and Soras, Virginia Rails and Least Bitterns are becoming more common each year.

I am quite sure that a Florida Gallinule nested here in 1909 as I saw one several times in June and a juvenile was shot here in September. Several times in May, 1910, when sweeping the marsh with my binoculars I saw a gallinule swimming about in an open space in the flags and in early June I flushed one from the thick flags but after a thorough search could not find the nest.

June 13, C. F. Stone, E. P. St. John and myself were searching the marsh for nests of rail and bittern and Mr. St. John found the gallinule's nest close by the place where I had flushed the gallinule. It was well hidden in a thick growth of sweet flag (*Acorus calumus*) and bulrushes (*Scirpus lacustris*) and was composed of dead flags woven around and supported by the last year's growth of flags. It contained ten eggs which appeared to be well along in incubation. The female must have just left the nest as the eggs were warm but we neither saw nor heard her while we were there. I got a good picture showing the nest and eggs at this time. I visited the nest many times after this but could not get a glimpse of the female.

June 26, there were but five eggs left in the nest, one with the chick exposed and struggling to free itself, but there were no other young ones visible.

Leaving the nest for about half an hour, I visited a nest of the American Bittern and exposed several plates on the five young bitterns. Returning to the gallinule's nest, I approached very carefully and found a downy young one sitting on the reeds where they had been broken down by my many visits. It sat there watching me, its eyes twinkling, starting up nervously now and then, and at my first move it slid into the water and disappeared so suddenly that I was almost sure that it had dived, and I did not see it again. The chick I had left partly in the shell about one-half hour before was now free and struggling to rise. After placing my camera and when nearly ready to make the exposure another chick appeared at the edge of the nest, peeped faintly and was answered by the chick in the nest. Then it climbed up the side and into the nest, climbing over the newly hatched one and I got the picture showing the older one with its wing (showing both digits) resting on an egg and the younger one not yet dry.

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[1] Proc. Bost. Soc. Nat. Hist., XII, 1868, 100–104.

I took the older one home with me and it seemed content to nestle in my hand or in a basket. One-half hour later I put it back into the nest and the younger one was not yet dry. They were both quite lively but did not attempt to leave the nest.

The young are born with their eyes open. The body is covered with a thick down, jet black and sooty black beneath; the head and wings are nearly naked; base of bill bright carmine; end of bill orange yellow; a tuft of down under the chin white, with a sprinkling of fine black, giving it a silvery appearance. The eyes show purplish through the skin. The outer digit of the wing is armed with a hooked spur or claw about one-eighth of an inch long, and I noticed a young one use the wing to pull itself up the side of the nest. The feet and legs are dull black.

June 28, there were but two eggs left in the nest and both were pipped. I caught a youngster just as it was getting away through the flags and it was the only one that I could find. I put it up on some bent over flags and got a good picture showing it nearly three-fourths life size with the bare wing and claw and the white beard prominent. It is almost impossible to catch a glimpse of a young one in the nest after they get dry as they leave immediately if they hear one coming, but after I had caught and put them back into the nest they remained still and I had no trouble to focus my camera and make exposures.

I heard the female about several times when I was at the nest but she did not show herself. I visited the nest several times after this date but saw no more of the family.— Verdi Burtch, *Branchport, N. Y.*

Wilson's Phalarope, A New Species for South Carolina.— On the 7th of September, 1910, while shooting on the eastern end of Sullivan's Island, near Charleston, South Carolina, I killed a Wilson's Phalarope (*Steganopus tricolor*). The bird is a male in winter plumage. It had alighted with about fifteen Yellow-legs on the edge of a freshwater pool left by recent rains. The pool is among sand dunes a few hundred yards from the nearest house and near the car lines. Sullivan's is one of the sea islands and is thickly settled except where the bird was found. The specimen has been deposited in the Charleston Museum (Spec. No. 7249). This is the first record for the species in South Carolina, and, so far as I know, for the Atlantic coast south of New Jersey.— Burnham Chamberlain, *Charleston, S. C.*

Baird's Sandpiper in Massachusetts.— While at Chatham, Mass., I obtained a specimen of Baird's Sandpiper (*Pisobia bairdi*) which was shot October 18, 1910, on Monomoy Point. The identification was verified by Mr. C. J. Maynard, of West Newton, who now has the skin.— Mrs. E. R. Jump, *West Newton, Mass.*

Eskimo Curlew.— It is rather with a sense of reluctance that I send the following record, knowing the suspicion which is bound to arise but, being an enthusiastic gunner myself, I think it may prove of some interest to that very small body of ornithologists who know anything about shore birds. The record is that of the much discussed Eskimo Curlew. It is only within the last year that I realized that this species was nearing extinction. Such a blunder, however, I consider excusable when I take up any recent text-book or list and find this species still mentioned as our most abundant curlew. I understand, however, that the last record of this species from Long Island was in 1884, or 26 years ago. It seems incredible that for 20 years the absence of this species should have passed without remark, unless it be explained, as the present record must be, on the grounds that every gunner supposed these birds were common enough but that he had never happened to see one.

In 'The Auk,' Vol. XXI, p. 79, I recorded a flight of Hudsonian Godwit on the 31st day of August, 1903. That was the morning after a heavy three days' storm, and on that day a friend of mine, an experienced gunner, shot an Eskimo Curlew at Quogue, L. I. I paid small attention to it at the time, believing it to be a fairly common bird. There can be little doubt that this record is correct. I understand that the record in 'The Auk,' Vol. XXI, p. 289, of a bird of this species shot on Sept. 14, 1902 is incorrect. However, it is a strange coincidence that Dr. Braislin, on the same page, refers to one shot from a flock of about 15 as they were passing along the beach, near Zach's Inlet on August 29, 1903. The storm continued on August 30, clearing on the 31st, when the flight above noted took place at Quogue, the birds coming from the west. Zach's Inlet is about 40–50 miles west of Quogue, so that it would seem that Dr. Braislin's record and mine would fit in rather well together. There seems to me no doubt that this bird was a specimen of the Eskimo Curlew.— Frederick Wm. Kobbe, *New York City.*

Kalm's Articles on the Passenger Pigeon.—In 'The Auk' for October, 1910, Dr. A. H. Wright published 'Some early records of the Passenger Pigeon' (pp. 428–443) and has referred to Kalm's Travels[1] wherein Kalm promises to "speak of them more particularly in another place" but Dr. Wright was unable to find "another place." The elusive articles by Kalm are practically unknown and Coues failed to find one of them but recorded, in the 'Bulletin' of the United States Geological and Geographical

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[1] The original of Kalm's Travels was published in Swedish in 1753–'61.

Survey of the Territories (V, p. 794), the Swedish original. The titles of the two are as follows: —

1. Beskrifning på de vilda Dufvor, Som somliga år i så otrolig stor myckenhet komma til de Södra Engelska nybyggen i Norra America. Af Pehr Kalm. < K. Vetensk. Acad. Handlingar, 1759, XX, pp. 275–295, 1759.

This is the original.

2. Beschreibung der wilden Tauben, die manche Jahre in unglaublicher Menge, in die neuen südlichen englischen Pflanzoerter des nordlichen Amerika kommen, von Peter Kalm. < K. Schwed. Akad. Wissensch. Abhandl., 1759, XXI, p. 268–285, 1762.

A translation of the preceding.

Kalm records his observations under the name "*Columba* (*macroura*)" and cites as synonyms "*Columba macroura*," Edwards, and "*Palumbus migratorius*," Catesby, thus confounding the Passenger Pigeon with the *Zenaidura macroura*.[1] Full descriptions of the male and female are given in Latin (pp. 275–279) and then the Swedish text follows, giving many details of the birds' habits and abundance.

As both articles by Kalm are inaccessible to most ornithologists, a translation would be desirable, even at this late day, and Mr. S. M. Gronberger, an assistant of the Smithsonian Institution, to whom I showed the Swedish article, is willing to turn it into English for the readers of 'The Auk,' if so desired.— THEODORE GILL, *Washington*, *D. C.*

[As shown by this communication, the readers of 'The Auk' are indebted to Dr. Gill as well as to Mr. Gronberger for the translation of Peter Kalm's paper on the Passenger Pigeon published *antea*, pp. 53–66. — EDD.]

Thoreau's Notes on the Passenger Pigeon.— In connection with Mr. A. H. Wright's compilation of 'Some Early Records of the Passenger Pigeon,' printed in 'The Auk' for October, 1910, Thoreau's records of this species as they appear in his 'Notes on New England Birds' (Boston, 1910) may be of interest, though covering a more recent period. These consist of thirty-eight entries in his Journal, occupying ten pages of the book and extending from 1845 through 1860. They probably give a pretty good notion of the abundance of the bird in the neighborhood of Concord, Mass., during that period. Apparently the Pigeons did not breed there very extensively at that time, though under date of Nov. 8, 1859, it is stated that "Coombs [one of the Concord pigeon-catchers] says that quite a little flock of pigeons bred here last summer." They were found from March through September, but most abundantly by far in the latter month. There were several stands in the neighborhood, and catching began about the middle of August. The notes contain nothing to indicate any marked diminution in their numbers between 1845 and 1860, and the last entry — on Sept. 4 of the latter year — records 'flocks of pigeons' seen on the 2d and 3d.— FRANCIS H. ALLEN, *West Roxbury*, *Mass.*

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[1] *C. migratorius* was not recognized as a distinct species by Linnæus till 1766.

Black Vulture in Stuben County, N. Y.—A Correction.— In 'The Auk,' Volume XXVII, page 208, will be found a note by me on the taking of a Turkey Vulture in northern Steuben Co., N. Y., on July 11, 1909. Mr. Cowan, in whose possession the specimen was, told me about it and I had faith in his judgment as he had Chapman's 'Handbook' and I had cautioned him to be sure of the identification. I have since had the pleasure of examining the specimen and find it to be without a doubt a Black Vulture (*Catharista urubu*). I regret that the error was made and my note written but am glad to be able to make the correction and record the specimen, as it seems to be the first record of the Black Vulture for Steuben County and the fourth for western New York.— Verdi Burtch, *Branchport, N. Y.*

Black Vulture in Virginia.— In looking over some back numbers of 'The Auk,' I came across Mr. John W. Daniels, Jr.'s 'Notes on the Black Vulture (*Catharista uruba*) in Virginia' (Vol. XIX, p. 397), extending the range of this bird northward to Norfolk and Princess Anne Counties. Within the last four or five years these birds have been regular summer visitors to York, Elizabeth City and Warwick Counties, on the north side of James River, a few pairs breeding in the last named county.— H. H. Bailey, *Newport News, Va.*

A Fourth South Carolina Record for the Saw-Whet Owl (*Cryptoglaux acadica*).— I am indebted to my friend, Mr. James P. Garick, Jr., of Weston, Richland County, for the gift of an adult female of this species, which was captured alive by him in his yard on November 11, 1909. Mr. Garick writes me that it was taken from a hollow of a tree about 100 yards from his house. It was first observed by his cook, who reported it to him, and he immediately secured it. The early date on which the bird was taken seems to warrant the belief that this species is a regular although rare winter visitor, and not of mere casual occurrence, its nocturnal habits making it difficult of detection.— Arthur T. Wayne, *Mount Pleasant, S. C.*

Breeding of the Barn Owl.— Mr. Arthur T. Wayne has published an account [1] of the finding of a set of eggs of the Barn Owl (*Aluco pratincola*) on this coast during the month of September. He also refers to Audubon's discovery of a nest containing young birds which he (Audubon) concluded were hatched in September. Mr. T. Gilbert Pearson [2] records this bird as breeding on the coast of South Carolina in April. In view of this a recent record (confirmatory of Mr. Wayne's account) may be of interest.

On September 24, 1910, after rowing across the Ashley River from Charleston, I landed at the Wappoo Fertilizer Mills, an abandoned and much dilapidated group of buildings. In the top of one of these buildings I found a set of four eggs placed in a large box which was supported by huge beams. As I approached the box an old Barn Owl jumped out and flew through a broken window. On examining the interior of the box I found that its contents were mostly old bones and feathers, while around the box and below some of the rafters I saw only disgorged hair and bones, indicating that the old owls tear the flesh from the bones to feed their young, while they themselves swallow bones, feathers, and all. The building has probably been abandoned for about fifteen years and I suppose that the owls have been breeding in it ever since. This would account for the great accumulation of bones and feathers. I also found in this box parts of the Meadowlark (*Sturnella magna*), the Green Heron (*Butorides virescens*), and the Marsh Hen (*Rallus crepitans* or *R. c. waynei*). Below the box I saw the skin of a black rat, and found the skull of a sparrow. Of the eggs taken, two were fresh, the third nearly so, while the fourth contained a small embryo.— RHETT CHAMBERLAIN, *Charlestown, S. C.*

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[1] Auk, XXV, 1908, pp. 21–24.

[2] Auk, XXV, 1908, pp. 316, 317.

White Pelican in South Carolina.— On October 26, 1910, a White Pelican (*Pelecanus erythrorhynchos*) was shot in the Santee swamp by a farmer, from whom it was obtained by Mr. William C. Smith of Charleston, in whose possession it now is. The bird measures approximately sixty-four inches in length as mounted, and the bill thirteen inches. The primaries are black, and the bill, pouch, and feet are yellow. These characters prove conclusively that the bird is not an albino Brown Pelican (*P. occidentalis*), and a record is thus established for a species which has apparently not been taken in South Carolina for nearly a hundred years. Mr. Wayne states [1] that he has never seen the White Pelican on our coast, and quotes Bachman's account as given by Audubon. Dr. Bachman procured two specimens on July 1, 1814, from a flock which he believed had laid eggs on the banks off Bull's Island.

The specimen in Mr. Smith's possession was apparently blown here by a West Indian hurricane which passed up the coast immediately before it was taken.— PAUL M. REA, *The Charleston Museum, Charleston, S. C.*

The Evening Grosbeak at Boston, Mass.— On December 5, 1910, two Evening Grosbeaks (*Hesperiphona vespertina vespertina*) were seen in Olmsted Park beside Leverett Pond in a birch tree. It was at this precise point in the park that the Orange-crowned Warbler and the Blue-grey Gnatcatcher had been seen two days previous, of which another general note furnishes the record. Neither bird was in the plumage of the adult male. One showed but a bit of yellowish color on the nape of the neck. The other was somewhat more yellowish. Both birds had a black tail tipped with white and the black upper tail-coverts also tipped with white. The bills of both were horn-color. The more yellowish bird, quite probably a young male, gave many clear whistles as he moved about in the birch, or dropped to the ground. The other bird, in the plumage of the female, responded with a slight chattering. The birds were viewed as near as fifteen feet. Both at length flew across the pond, where the young male's whistles could still be heard. These birds were thus in Brookline as well as Boston and crossed the waters on which the rare wild ducks wintered last season (Auk, October, 1910, pp. 390–408). Two other records of a single bird each, seen by other observers, have come to my knowledge, indicating that once more this far northwestern bird has appeared in eastern Massachusetts.— HORACE W. WRIGHT, *Boston, Mass.*

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[1] Birds of South Carolina, Contr. Charleston Mus., I, 1910, p. 12.

Lapland Longspur and other Birds in Delaware.— December 3, 1910, while tramping a tidal marsh near Delaware City, Del., in company with Dr. Spencer Trotter of Philadelphia, Pa., we flushed three birds we thought at long range to be Titlarks (*Anthus pensilvanicus*). On following them up Dr. Trotter shot one and our surprise was great to find it a fine male Lapland Longspur (*Calcarius lapponicus*), a very rare bird for this section and a first record for Delaware. While the other two birds were seen later they could not be positively identified as of this species.

In 'Cassinia' for 1906, page 63, a total of seven individuals of this species from the Delaware Valley are reported by Mr. R. F. Miller, covering from the first one noted by John Cassin, found in a Philadelphia city market in January, 1849; one on League Island, Philadelphia, about 1864; four shot in New Jersey in 1895 (two of these near Princeton, possibly not strictly Delaware Valley); the other seen at Harrowgate, Philadelphia, November 22, 1904.

Among other birds there were observed at the above noted time and place, several Titlarks (*A. pensilvanicus*), a flock of twenty Horned Larks (*Otocoris alpestris alpestris*), two shot; two Great Blue Herons (*Ardea herodias*); six Wilson's Snipe (*Gallinago delicata*), and several Savannah Sparrows (*Passerculus sandwichensis savanna*).— C. J. PENNOCK, *Kennett Square, Chester Co., Pa.*

The Lark Sparrow in Massachusetts— On September 25, 1910, a fine Lark Sparrow (*Chondestes grammacus*) was observed at Berlin, Mass. While walking on the Clinton Aqueduct in that vicinity a sparrow flew up from the ground and rested on a low fence beneath us in fine light and situation. This bird remained in a favorable position for several minutes, so that all distinguishing features, even its swollen grayish bill, were easily observed by our party of four. A friend living in this vicinity, who is a bird-lover and good observer, records an individual of this species seen in this locality in the spring. I have noticed this year and last that migrating sparrows are found here in very large numbers and in our walks discovered twenty-six species of land birds in a district of short radius.— J. E. KLOSEMAN, *Dedham, Mass.*

A Note on the Prothonotary Warbler.— In the many biographical sketches of the Prothonotary Warbler, one finds considerable unanimity concerning the succession of mating and nest building and the sex building the nest. For instance, Loucks in his 'Life History of the Prothonotary Warbler,'[1] states: "Soon after mating, the birds begin to build their nest....In the construction of the nest, the female bird works alone. I have never yet seen a male really aiding in this task." The authors, studying in localities where the bird is more or less abundant during the breeding season, evidently made such notes from series of observations. A single instance contrary to the above is, therefore, probably less important than it is interesting. The case in point is that of a male Prothonotary Warbler which appeared at Ithaca in the spring of 1910. It was first seen May 31 in some willows overhanging a back-water from Fall Creek, one of the main tributaries of Cayuga Lake. It was singing at the time but soon flew down to the water's edge. Here it seized a good sized straw and thence carried it to a hole in a dead stub some five feet above the water. The site was an abandoned Downy Woodpecker's nest, the opening of which had, by some agent or other, been enlarged leaving its borders jagged and rough. While the bird was under observation, it continued flying to and from the hole carrying bits of grass, straw, bark and the like, most of which was obtained at the water's edge. It sang very frequently, often with nesting material in its bill, which was opened so widely during the process that the material was sometimes lost. The nest was not examined closely at this time for fear of disturbing the bird but from the place of observation the nesting material was seen projecting from the hole. Nothing was seen of a female. Two days later the bird had ceased carrying nesting material and was singing in the willows nearby. Upon careful examination the nest was found to be quite complete but there were no eggs nor was there yet any sign of a female. For eleven days this male was seen or heard singing about the spot but no eggs ever appeared in the nest and no female was ever discovered. He was never seen to enter the nest after the third day of observation but, with one exception, was found at all hours within fifty feet of the nesting site, usually singing. On one occasion he was seen to drive away a Bluebird which alighted on the stub. On June 12 he disappeared and did not return.

From these observations it would seem that this male, very shortly after arriving and before finding a mate, selected the nesting site and began building the nest. Furthermore, after completing the nest he waited, apparently for a female, at least nine days before deserting the site which he had chosen. In localities where the species is more abundant and mating is therefore assured, the necessity for the males building the nest may never arise. But the fact that this male, when isolated, was able to select the site and complete the nest in the absence of the female is quite significant.— Arthur A. Allen, *Cornell University*, *Ithaca*, *N. Y.*

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[1] **Loucks, W. E. Bulletin 4, Article 3, Illinois State Laboratory of Natural History.**

A Third Autumnal Record of Kirtland's Warbler (*Dendroica kirtlandi*) **for South Carolina.**— Early in the morning of October 4, 1910, I heard on Oakland plantation, Christ Church Parish, a peculiar call-note, intermediate in tone between those of the Prairie Warbler (*Dendroica discolor*) and Palm Warbler (*D. palmarum*). The sound came from among the terminal ends of a very leafy branch of a small live oak tree, but although I was within twenty feet of the sound it was impossible to see the bird. I was satisfied then that it was a Kirtland's Warbler, and convinced when it flew and alighted on a dead branch of another live oak near at hand — but too close to obtain it in perfect condition. The pale yellow under parts and the deliberate wagging of the tail, aside from its large size, made the identification as absolute and conclusive as though it was in my hand. Upon my retreating to secure it in perfect condition the bird flew and lit among hundreds of lavender bushes across a canal. In attempting to enter the place by a circuitous route it flew again and this time out of vision. The pale yellow under parts suggested that it was a female. The bird was entirely alone and, like the one I shot on Octover 29, 1903 (Auk, XXI, 1904, pp. 83, 84), was absolutely fearless.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Mockingbird in Rhode Island.— Miss Julia Herreshoff of Bristol, R. I., communicates to me the following in a letter dated November 8, 1910: "The Mockingbird came with the Blackbirds, first noticed March 12 (1910). He was near the house for a fortnight and then deserted his black friends for Robins and lived at the Old House (the Herreshoff homestead next door). I did not see him after July 25 when tenants took possession. He was quite friendly though I think by his early coming there was no chance of his being an escaped cage-bird."— REGINALD HEBER HOWE, JR., *Thoreau Museum, Concord, Mass.*

A Pair of Mockingbirds near Boston in 1902.— Concerning the note in the October 'Auk' of 1910 entitled: "The Mockingbird near Boston," signed by Mr. Francis H. Allen of West Roxbury, I would say, that in 1902 a pair of Mockingbirds (*Mimus polyglottos*) built two nests within sight of my home in Roslindale. The male was constantly under our kitchen windows. He entertained us the entire summer, not only with his singing, but also by his gymnastics while doing so. He would frequently light on the ridge-pole of my neighbor's house, and vertically bounce up and down, five to ten feet, singing all the while. He would do this frequently eight or ten times in succession. I first noticed the male when the apple trees leaved out, but neglected to record the exact date.

Shortly afterward he was joined by a female. They built in a large white oak tree situated midway between Congress and Fletcher Streets on Center Street, Roslindale.

The nest was quite high up. Four young were raised, but were presumably stolen by a laborer who was working on a sewer, then in construction, on Center Street. When the young were about to leave the nest, one of my sons heard the man in question say, that he was "coming out early to-morrow morning and take those birds." As the nest was empty on the day designated, it is quite probable he succeeded in doing so. The parent birds were inconsolable for a time. Soon, however, they built again; this time low down in a golden elderberry bush which grew, within twenty feet of the house, on the front lawn of one of my neighbors. Here three young were raised and successfully launched from the nest. I saw two of the young birds killed by neighbor's cats. This same fate overtook the mother.

One day while sitting on my piazza, I saw in the vacant lot opposite, a cat spring into a hollow apparently in the act of catching a bird. Hearing the great distress of the male mockingbird directly over the hole, I ran to the place, but alas! too late. The cat bounded away but in her fright dropped the bird. Immediately picking it up, I recognized the still beautiful though lifeless mate of the distracted father who was hovering over me.

The father mockingbird and one of the young were constantly seen about the neighborhood until autumn, when they probably went South. In passing, I may say that it was this particular pair of mockingbirds which first incited me to the study of bird life. Whether the pair of mockingbirds described above are the pair referred to by Mrs. Seriah Stevens or not I do not know, but I have never heard of other than this pair nesting in Roslindale in 1902.— Julia Wingate Sherman, *Roslindale, Mass.*

A Blue-gray Gnatcatcher in Brookline and Boston, Mass.— On December 3, 1910, when passing through Olmsted Park, lying partly in Boston and partly in Brookline, I came upon an Orange-crowned Warbler (*Vermivora celata celata*) in a planting of shrubbery. It was an unusually brightly plumaged bird, others which I had seen in former seasons having been much more dusky and dull-plumaged. This warbler had just gone from view by taking a short flight out of my range of vision, when another very small bird was seen directly before me, which by coloration, form, and movement I perceived at once to be a Blue-gray Gnatcatcher (*Polioptila cærulea*). The tone of color of the upper parts was a very clear blue-gray, and the nervous switching and erecting of the tail were characteristic movements. I had several good views of the bird both in trees, on shrubs, and on the ground before it passed from sight, when automobile travel intervened. It appeared to be gleaning food of larvæ or insect's eggs from the twigs and remaining leaves. The following day five other observers, associate members of the A. O. U., to whom the knowledge had been given, also saw this bird in the same park a little farther southward. The earliest observer found it still in the company of the Orange-crowned Warbler, but the later group, while seeing the Gnatcatcher, was unable to find the warbler. On December 4 the bird was on the Boston side of the park, having been on the Brookline side when seen by me. In 'The Auk' for January, 1905, p. 87, is a note of my earlier observation of a Blue-gray Gnatcatcher on October 22, 1904, in the Boston Public Garden.— Horace W. Wright, *Boston. Mass.*

An Albino Robin.— In a flock of about twenty Robins an albino Robin was seen in "30 Acres," Roslindale, Mass., September 22, 1910. Two days later, I saw this bird twice, feeding on Rowan berries which grew on an ornamental tree opposite my home. This time the breast of the Robin was turned towards me. The light being perfect, I felt myself fortunate. The body was pure white with the exception of a few dusky feathers on the back. A perfect "robin-red-breast" red crescent showed on the upper breast similar to the black one of our Northern Flicker. A few red feathers were sprinkled over the lower underparts. The wings were largely dusky, as were the central tail feathers, the outer ones being pure white. He looked much larger than the average Robin both in flight and when perched. This was undoubtedly an illusion due to color.— Julia Wingate Sherman, *Roslindale, Mass.*

Notes from Boulder Co., Colorado. Least Bittern.— A pair of these birds was seen in a cat-tail marsh near Boulder on May 28, 1910. On June 5 their nest was found containing four eggs. On June 12 one of the birds was observed on the nest which at that date contained five eggs. On June 18 the five eggs were in the nest, though no birds were observed. On July 9 what appeared to be a young bird left the nest; one sterile egg remained. I have found no other record of the nesting of the Least Bittern in Colorado.

California Cuckoo. A cuckoo, probably of this form, was seen on July 9 and again on August 6, 1910, in the outskirts of Boulder.

Dickcissel. A male was seen on July 9 and 24, 1910, near Boulder. The bird was in fine plumage and was singing.

Cañon Wren. The new Check-List limits the range of this wren in eastern Colorado to "southeastern Colorado." I have found the species a quite common resident in the cañons near Boulder, which is near the middle of the northern half of the State. A nest with young was found on July 10, 1910, well hidden in a crevice in one of the large rocks on a steep slope of one of the cañons.

Prairie Marsh Wren. A female marsh-wren, taken Oct. 8, and a male taken Oct. 22, 1910, on the plains near Boulder, were identified by Mr. Oberholser as *T. p. iliacus*. Prof. Cooke states that these are the first actual records for Colorado for this form. From the Check-List range this would seem to be the form expected east of the range, though Mr. L. J. Hersey (Condor, July–August, 1909) records *T. p. plesius* as common at Barr, which is about thirty miles further east on the plains.— Norman deW. Betts, *Boulder, Colorado.*

Two Unusual Massachusetts Records.— On October 20, 1910, Mr. T. C. Wilson, of Ipswich, brought me a young male Clapper Rail (*Rallus crepitans crepitans*). It was shot in the salt marshes of that town near the Poor Farm, and was a young bird of this season. This seems to be the second authentic Massachusetts record.

Three Spoonbill Ducks (*Spatula clypeata*) came into Wenham Lake, Massachusetts, on October 15, 1910. I secured all of them. There are only two other records of this duck at Wenham from 1899 until the present date. All three specimens were males.— J. C. Phillips, *Wenham, Mass.*

Old Records for Massachusetts and Rhode Island.— In looking over my note books recently I came across a few entries which seem to me sufficiently interesting to record in 'The Auk,' and which may possibly be of use for future reference.

Nantucket Island, Massachusetts. While out shooting at the western part of the island a number of years ago, I heard a shot close at hand, and on driving up I found Mr. Eschevria (a regular summer resident) standing near the shore of the Reedy Pond. I found be had just killed a Long-billed Curlew (*Numenius longirostris*). I carefully examined the bird, which he offered to give me, but which I declined. In all the years I have been shooting on the island this is the only authentic instance that I am aware of that it has been taken here, and I therefore desire to record it. I regret now that I did not make a note of the date of capture. It was, however, in August or September.

November 5, 1875. Shot one Pintail Duck (*Dafila acuta*).

October 4, 1877. Shot two Red-backed Sandpipers (*Pisobia alpina sakhalina*).

September 23, 1878. Two Passenger Pigeons (*Ectopistes migratorius*), in immature plumage, on the outskirts of Siasconset Village.

August 31, 1889. Shot one Red-headed Woodpecker (*Melanerpes erythrocephalus*), in immature plumage, apparently born on the island. September 23 saw a young bird, on November 23, saw another, and on September 10, 1881, shot one.

October 2, 1880. Saw six Wood Ducks (*Aix sponsa*) in the north head of the Hummuck Pond and shot three of them; they were not in full plumage.

February 22, 1891. Saw five or six Meadowlarks (*Sturnella magna*).

August 25, 1884. Shot one Marbled Godwit (*Limosa fedoa*), the only one I have heard of there.

August 19, 1888. Saw two Willet (*Catoptrophorus semipalmatus*). I have seen several others, but have not the dates.

August 21, 1892. Shot one Hudsonian Godwit (*Limosa hæmastica*); had some red feathers on the breast.

February 21, 1892. We shot a Loon (*Gavia immer*) to-day from the Jetty, which had scarcely any feathers on the wings; the bird could not possibly have flown. I took it to be a case of moult.

Muskeget Island, Massachusetts, March 11, 1894. Six Sanderlings (*Calidris leucophæa*) have lived in the vicinity the past winter.

Somerville, Massachusetts, March 20, 1840, and Revere, Mass., March 6, 1880. On each of these dates Mr. George A. Tapley of Revere, Mass., shot an American Golden Plover (*Charadrius dominicus*). Mr. Tapley informed me he had killed one other in the spring.

Revere, Mass., May, 1889. Mr. George A. Tapley saw six Pectoral Sandpipers (*Pisobia maculata*), in one flock, and shot one of them; May, 1890, he saw two and shot both.

Wellfleet, Cape Cod, Mass., August, 1865. Shot two Marbled Godwits (*Limosa fedoa*).

West Island, Seconnet Point, Rhode Island, May, 1873. In the early part of this month, three Hudsonian Godwits (*Limosa hæmastica*), all there were. They alighted on the end of a gravel spit which was exposed at low tide on the north side of the island near the boat house. I secured all three at the first shot. They were in the gray plumage.

West Island, Seconnet Point, R. I., April 27, 1875. Shot one Red-throated Loon (*Gavia stellata*), April 16, 1878. A good many flying on migration; wind light northeast. Shot one on April 1, 1881; one on April 13, 1884; three on April 14, 1886; one on April 15 and four on April 20, 1887; one April 21, 1887, and April 16, 1892. A migrating movement eastward; birds flying about sixty yards high; noted one flock of five, one of six, the others scattering, about twenty-six birds in all. April 17, 1892, saw eight flying on migration; wind light west.

April 14, 1886. Quite a flight of Loons (*Gavia immer*), on migration; wind east, a gentle breeze.— George H. Mackay, *Nantucket, Mass.*

Massachusetts Notes.— On October 24, 1910, I shot a partial albino Sharp-tailed Sparrow (*Passerherbulus caudacutus*) on a salt meadow at Nantucket, Mass. I had seen it several days previous but was unable to secure it then. The upper parts are blotched with several patches of pure white feathers. The coverts of the left wing are also pure white while the feathers on the right wing are only margined with white. The tail, crown and primaries are normal in color as are also the underparts and nearly all the rest of the bird.

Early in November, 1909, two White-fronted Geese (*Anser albifrons gambeli*) were shot at a stand on Sesachacha Pond, Nantucket. I heard of their being killed last spring and was told by the man who had one of them mounted that they were Lesser Snow Geese. However, this bird has recently been presented to the Boston Society of Natural History and has proved to be *Anser albifrons gambeli*. It is a young bird and the white at the base of the bill is only just beginning to appear. Also the tips of the feathers of the underparts show faint traces of black. There are only three other records for New England, and these are all from Massachusetts. A male was shot at Quincy some time about 1848–50 and was presented to the Boston Society of Natural History.[1] At present there is no trace of this bird. Dr. T. M. Brewer, in 'A Defence of his Catalogue of the Birds of New England,'[2] says: "*Anser gambeli*, between 1836–46, was much more common than it apparently is now, but even now there is no lack of evidence of its presence.... A fine specimen in immature plumage has been recently taken in Gloucester and is now in the collection of Mr. William Jeffries of Boston." The bird referred to was shot October 20, 1876, at West Gloucester, and at the time was supposed to be *Anser albifrons gambeli*; it turned out, however, to be a Blue Goose. This also is now in the collection of the Boston Society of Natural History and is the only one ever recorded from this State. Possibly after all *A. a. gambeli* was not as common even between 1836 and 1846 as Dr. Brewer supposed. The second authentic record was one shot at Plymouth, November 26, 1897, by Mr. Paul W. Gifford.[3] It is an adult specimen and is to-day in Mr. William Brewster's collection. Of these few records the third is the most interesting, for it is an adult bird that was caught alive in a wounded condition early in August, 1907, at Great Neck, Ipswich, by Mr. A. B. Clark.[4] This bird is still alive and I believe several unsuccessful attempts have been made to cross it with a wild Canada Goose.

In 'The Auk,' Vol. XXVII, No. 3, page 339, Mr. R. Heber Howe, Jr., mentions a King Rail (*Rallus elegans*) being shot at West Barnstable on Dec. 30, 1909, as the ninth record for the State. I have five more unrecorded specimens making a total of fourteen. The first one was shot on the Neponset meadows, near Canton, on September 9, 1893, and is in the collection of the Boston Society of Natural History. The other four were all shot in 1909, at Chatham, and as far as I can find they are the only ones known to the local gunners ever to have been taken there. Of these four the first was taken January 9, 1909, by Mr. Russell Bearse in a brackish marsh while he was duck shooting by moonlight. This is now owned by Mr. W. E. Freeman of Arlington. The second was shot by Mr. W. A. Carey of Boston on October 2, and is now in his collection. He was shooting quail along the edge of a cranberry bog when the dog flushed this bird. The third was caught alive on October 25 by a setter dog in a bit of salt marsh, and is now in the collection of the Boston Society of Natural History. The fourth was killed by Mr. Frank Eldredge on October 20. This one was shot on Monomoy Island, in a salt meadow where Mr. Eldredge was after shore birds. It seems very remarkable that these last three should have all been taken within the space of about three weeks time and all within an area of a few square miles. Undoubtedly the King Rail is more abundant than is generally supposed, and although it is thought that it may breed within the limits of the State, no authentic case has yet been recorded. However, this recent abundance may lead in the near future to some such discovery.— S. Prescott Fay, *Boston, Mass.*

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[1] Cabot, Proc. Bost. Soc. Nat. Hist., Vol. III, 1851, p. 136.

[2] Bull. Nutt. Ornith. Club, Vol. II, April, 1877, p. 46.

[3] Auk, Vol. XVIII, pp. 135, 136.

[4] Auk, Vol. XXV, 1908, p. 80.

Number of Species and Subspecies in the New A. O. U. Check-List: A Correction.— In 'The Auk' for October, 1910 (XXVII, pp. 468, 469), the number of species in the third edition of the A. O. U. Check-List is given as 802, and the number of subspecies as 394, making a total of 1196 forms. Prof. W. W. Cooke later informed me that he made the numbers to be, respectively, 804, 396, 1200. A recount shows Professor Cooke's numbers to be correct, namely, 804 species, 396 subspecies, and 1200 forms.— J. A. A.

RECENT LITERATURE.

Carriker on the Birds of Costa Rica.[1] — In this work of some 600 pages, our knowledge of Costa Rican birds is brought thoroughly up to date. The author's style is pleasing and his method of treatment is both modern and comprehensive. A total of 753 species and subspecies is recorded, with full citations of Costa Rican references and many hitherto unpublished records, based chiefly on the collections of Ridgway and Zeledon, Carriker, Underwood and Lankester.

The local distribution is well worked out and treated in more detail than in any previous work. Under almost every species are interesting notes on the life history, from the author's own experiences, in many cases with descriptions of nest and eggs. These form an important addition to our knowledge of Neotropical bird-life. Under the Tanagers and Finches Mr. W. E. C. Todd has incorporated in the text many valuable critical notes. Keys are given to the species of most of the lower groups as far as the Cotingidæ, with the evident intention of supplementing those in the first four volumes of Ridgway's 'Birds of North and Middle America.'

The 60 pages of introductory matter treat, among other subjects, of "Geography and Physiography," "The Life Zones" and "History of the Ornithology of Costa Rica." A Bibliography is of course included, and a comprehensive descriptive list of localities at which birds have been collected. Some general notes on the habits of both the winter visitant and the resident species are also to be found here. At the end of the volume is a large folding map of Costa Rica.

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[1] An Annotated List of the Birds of Costa Rica including Cocos Island. By M. A. Carriker, Jr. Reprinted from Annals of the Carnegie Museum, Vol. VI, pp. 314–915, with map. "Issued August 29, 1910."

Mr. Carriker's division of Costa Rica into life-zones deserves careful consideration. Three Primary Areas, Boreal, Sonoran and Tropical, are recognized. These are divided into six Regions, and these again into fourteen Zones or belts. Judging by this list it is certainly true, as the author states, after referring to the life zones of North America, that: "In Central America, however, we have a much more complicated state of affairs than in North America," for "some zones or belts of the Tropical occupy exactly the same ground as some of the Sonoran, so that it is only by studying the affinities of the various species and determining whether they are modified Tropical or Sonoran forms, that we are able to account for their presence in certain regions and give a reasonable explanation of the finding of two widely different types in apparently the same zone."

The practicability of such an arrangement is open to doubt, particularly as the determination of the origin of many species is by no means an easy matter and we fear that the author's attempt to draw a line between "Tropical" and "Sonoran" species has not been wholly successful. For example, the correctness of ascribing a northern origin to such species as *Planesticus nigrescens*, *Myioborus torquatus*, *Pheucticus tibialis*, *Amaurospiza concolor*, *Phainoptila melanoxantha* and several others is surely very doubtful.

A notable feature of the Costa Rica avifauna is the remarkable rarity of many of the resident species. Some of these are not found outside of Costa Rica and the adjoining parts of Panama, and their rarity is believed to be actual, and not merely apparent as in the case of many very local species or those of retiring habits or found in inaccessible places. The author believes that these rare species "belong to a vanishing fauna, and for reasons of high specialization, interbreeding, or inability to hold their own in the ever present struggle for the survival of the fittest, are slowly disappearing." With so large and varied a bird population concentrated in so restricted an area it is natural that many species should be able to exist only in small numbers, and thus be ever in danger of extermination. This fate has doubtless already overtaken several species and may explain the apparent absence of a number of forms that have been found both north and south of Costa Rica, as, for example, *Amaurolimnas*, *Rhopoterpe*, *Pyrocephalus*, *Myrmeciza laurencei*, *Gampsonyx*, *Ictinia*, *Ceryle inda* and *Rhynchortyx*.

There are several interesting facts in regard to the Costa Rica avifauna and some interesting comparisons that may be made, that have not been brought out by the author and it may be worth the space to go over them here.

As stated above the total number of forms given is 753. From this number the five Cocos Island species may be subtracted as being not truly Costa Rican, leaving 748 species and subspecies. Deducting the latter, of which there are about 33, we have 715 full species remaining.

It is of interest to compare this total with the number of species known from the region covered by the A. O. U. Check-List. From this vast area, the entire North American continent north of Mexico, including also Greenland, Lower California and numerous islands, the total recorded number of forms is 1200. The proportion of Accidental Visitants (81) and subspecies (385) is far higher than in the case of Costa Rica. Deducting these leaves 734 full species, only a few more than the number known from Costa Rica.

When it is considered that the whole of Costa Rica is not as large as the peninsula of Florida, the wonderful richness and variety of its bird life — undoubtedly one of the most remarkable bird faunas in the world — will be appreciated.

About 120 of these Costa Rica forms are winter visitors or transients (several North American migratory species are represented by two subspecies). Leaving these out of account, and also making allowance for 3 or 4 stragglers over the southern boundary, and an equal number of doubtful species known from only a single specimen, we find a round 600 species constituting the resident avifauna of Costa Rica.

Many genera of the smaller birds are remarkably represented. Thus *Trogon* and *Euphonia* have each nine species, *Tangara* (*Calliste*) has seven species and one subspecies, *Thryophilus*, seven, *Catharus*, *Columba* and *Geotrygon* each have six, *Basileuterus* is represented by five species and two subspecies, *Saltator* by five species and two subspecies, and *Planesticus* by five species and one subspecies.

Many of the "lower" groups on the other hand make a comparatively poor showing; thus there are only four breeding species of Anseres. Many genera represented by breeding forms in both the Nearctic region and South America are here wanting or occur only as migrants. The astonishing number of four families, 50 genera and 205 full species are not known to range beyond the northern boundary of Costa Rica.

A new genus *Dicrorhynchus* is proposed by Mr. Carriker for the curious barbet, *Tetragonops frantzii* Sclater. It is distinguished structurally from its only other near relative, *Semnornis rhamphastinus*, solely by a slight difference in the form of the bill, differing otherwise only in coloration.

The following new species and subspecies are named and described: *Columba flavirostris minima*, *C. nigrirostris brunneicauda*, *Chæmepelia passerina neglecta*, *Selasphorus simoni* (nearest *S. ardens*), *Dendrocincla anabatina saturata*, *Campylorhamphus pusillus borealis* and *Corapipo altera albibarbis*.

This last subspecies, has lately been described by Dr. Hellmayr under the name *Corapipo leucorrhoa heteroleuca*, this name antedating that given by Mr. Carriker.

The three current subspecies *Attila citreopygus luteolus*, *Pachyrhamphus polychropterus similis* and *Pachysilvia ochraceiceps pallidipectus* are discussed and considered as not entitled to recognition.

Several forms usually accorded specific rank, namely *Urubitinga ridgwayi*, *Amazona salvini*, *Ceophlœus scapularis*, *Agyrtria decora*, *Selasphorus torridus*, *Trogon underwoodi*, and *Euphonia gnatho*, are reduced to subspecies, some of them, in our opinion, without sufficient reason, for though they are undoubtedly closely allied representative forms, no evidence of intergradation is brought forward. The new *Corapipo* also seems to us worthy of specific rank. On the other hand *Saltator intermedius* and *Astragalinus columbianus* are granted binomials.

The list of species and subspecies is so nearly complete that we have noticed the omission of only one form, *Sayornis nigricans nigricans*, for which there are two authentic Costa Rican records.

While *Ceryle inda* and *Tyrannus dominicensis* have apparently never been taken within the limits of this list, both have been found common at Greytown, Nicaragua, just across the line, and there can be no doubt of their occurrence in Costa Rica.

The occurrence of *Stelgidopteryx serripennis serripennis* as a breeding species is noteworthy, but it may be well to again call attention to the fact that the presence of black on the under tail coverts is not necessarily an indication of intergradation with any of the other forms of *Stelgidopteryx*, as this is a variation known to occur throughout the bird's range.

Very few if any typographical errors are discoverable, and the orthography of the scientific names, revised by Mr. Todd, is almost above criticism. There are a few inconsistencies in the gender endings not corrected in the "Errata," but few works are altogether free from these trifling defects.

The system of nomenclature is consistently trinomial, but in some cases where the specific name should be repeated to indicate the typical subspecies it has not been done.

Phainoptila is wrongly placed in the Ampelidæ; *Falco columbarius* is interpolated between *F. albigularis* and *F. aurantius*, which appear in the Key as *F. rufigularis* and *F. deiroleucus;* the Brown Pelican stands as *Pelecanus fuscus* instead of *P. occidentalis*.

The mere mention of these slight errors unduly magnifies their importance. Few of them are of any consequence and they do not detract from the general excellence of the work.

The absence of an index is an omission for which the author is probably not responsible. Doubtless there is one supplied with the complete volume of the 'Annals' from which this paper is reprinted, but a work of the size and importance of this deserves an index of its own.— W. DeW. M.

Ferry on a Collection of Birds from Costa Rica.[1]— This is an annotated list of 74 species collected by the author in Costa Rica during January, February, and March, 1908, at various localities on the Atlantic slope, mainly at Guaybo, Coliblanco, and Turrialba. The annotations often include interesting notes on the habits and haunts of a number of the species listed. The paper is posthumous, Mr. Ferry having died February 11, 1910, at the beginning of what seemed a promising scientific career (*cf.* Auk, XXVII, April, 1910, pp. 240, 241).— J. A. A.

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[1] Catalogue of a Collection of Birds from Costa Rica. By John Farwell Ferry, Assistant, Division of Ornithology. Field Mus. Nat. Hist., Orn. Ser., Vol. I, No. 6, pp. 257–282. "September, 1910."

'**A Naturalist in the Bahamas.**'— A volume with this title,[1] just published, contains a biographical sketch, by the editor, Professor Henry Fairfield Osborn, and the collected papers of the late Dr. John I. Northrop, who died, full of promise for an eminent career as a scientific investigator and teacher, at the early age of 29 years, June 25, 1891, his death resulting from the accidental explosion of alcohol. Dr. Northrop was interested in a wide range of subjects, including ornithology, and at the time of his death was an Associate of the American Ornithologists' Union. In 1890 he, with his wife, visited the Bahamas, where he spent six months in making collections in nearly all branches of natural history. Among the birds he obtained was a new species of *Icterus* (*I. northropi* Allen), described and figured in 'The Auk' (Vol. VII, October, 1890, pp. 344–346, pl. i, colored). He made a collection of 75 species of birds on Andros Island, an account of which was published by him, also in this journal (Vol. VIII, 1891, pp. 64–80). Besides these papers the present volume contains an account of the flora and a narrative of the Bahama trip by Mrs. Northrop, and a large number of papers by various specialists on the invertebrates collected by Dr. Northrop on the Bahama expedition, in addition to papers by Dr. Northrop and Dr. and Mrs. Northrop jointly, on a variety of scientific subjects — geological and botanical as well as zoölogical.

In Professor Osborn's appreciative notice of Dr. Northrop he states that the finished and unfinished work he left behind him "gave evidence of acute powers of observation, of painstaking study, and of strict regard for truth in the recording of facts"; and adds that he "had in mind the ultimate publication of a volume on the Bahamas which would embody the results of his work there and of other contemplated trips to the islands." The present memorial volume was planned to carry out this project, so far as possible, and it is hoped that through it "the memory of his labors and activities, brief as they were permitted to be, may live, and the influence of his example be handed down to future generations of the students of Columbia and of other universities." — J. A. A.

Cooke's 'Distribution and Migration of North American Shorebirds.' [2] — The 85 recognized forms of Shorebirds (Limicolæ) — 76 species and 9 subspecies — represented in North America are here treated in detail in respect to their migrations and general distribution throughout the year. Of these 85 forms 7 are found only south of the United States, 5 only in Greenland (in the Western Hemisphere), and 15 others occur only as stragglers from Europe and Asia, 58 belonging properly to the avifauna of North America north of Mexico. Of these 8 are Arctic and subarctic species that never visit the United States, and the breeding range of 36 others is wholly north of the United States.

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[1] A Naturalist in the | Bahamas | John I. Northrop | October 12, 1861–June 25, 1891 | A Memorial Volume | edited with a Biographical Introduction | by Henry Fairfield Osborn | [Seal of Columbia University] New York | The Columbia University Press | 1910 — 8vo, pp. xv + 281, with 37 plates and 9 text figures. The Macmillan Company, 66 Fifth Avenue, New York. $2.50 net.

[2] Distribution and Migration of North American Shorebirds. By Wells W. Cooke, Assistant, Biological Survey. Bulletin No. 35, Biological Survey, U. S. Department of Agriculture. 8vo, pp. 100, with 4 half-tone plates. Washington, Government Printing Office, 1910. Issued October 6, 1910.

In the introductory pages of this excellent summary the species are listed in twelve categories on the basis of their areas of occurrence in North America and their breeding and migration ranges. Following these a few pages are devoted to the general subject of the migration of Shorebirds, which in most cases make migratory journeys of over a thousand miles, and in some instances breed in arctic tundras and winter from the southern border of the United States south, according to the species, to the southern extremity of South America, some of them thus making semiannual migrations of 7,000 miles. The spring route is also different, in the case of some species, from that taken in the fall. The following statement is of special interest, since it is undoubtedly founded on thorough investigation: "Though many of the shorebirds breeding in North America winter in the southern parts of South America, none of them breed in their winter home. Special attention needs to be called to this fact, because nearly a dozen species of this family — among which may be noted particularly the Greater and Lesser Yellow-legs and White-rumped Sandpiper — have been reported as breeding near the southern end of South America. In no case has it been claimed that the eggs have been found, and all the records are based on the finding of young not fully grown or in most cases simply from the presence of individuals during the usual breeding season of local species. This latter reason is not even presumptive of breeding. . . "

The species are considered, in systematic sequence, with reference (1) to their breeding range, (2) their winter range, (3) their migration range, (4) the spring migration, (5) the fall migration. In the case of the Old World stragglers occurring in America, each is disposed of in a paragraph of ten or twelve lines, while from one to three pages are required to deal with the species of regular occurrence. The breeding range is given in considerable detail, while a few lines are sufficient to state the winter range, but both the spring and fall migrations are stated in very satisfactory detail as regards localities and dates; the more important records include the name of the authority for the record.

"The data," says the author, "on the breeding and wintering of the shorebirds has [have] been collected from all available printed sources, from the manuscript reports of the field naturalists of the Biological Survey, and from the specimens and catalogues of the United States National Museum. The dates of migration have been obtained principally from the migration schedules sent in by the several hundred observers in the

United States and Canada, who for a quarter of a century have contributed to the Biological Survey spring and fall reports of their migrations." It is needless to say that such extended resources have never before been available as the basis for such a study, and the present paper is worthy of the wide reputation Professor Cooke had already established as a specialist on the migration and distribution of North American birds. Four species are illustrated in as many half-tone plates, from drawings by Louis Agassiz Fuertes.

The "rapidly approaching extinction [of the Eskimo Curlew], if indeed any still exist," is thus accounted for: "A simple explanation is that during recent years, especially since 1880, its former winter home in Argentina has been settled and cultivated, while its spring feeding grounds in Nebraska and South Dakota have been converted into farm land." The species has been recorded, it is here stated, "only a few times" during the last fifteen years, "and apparently only three times in the ten years previous to 1909," — J. A. A.

Beck's 'Water Birds of the Vicinity of Point Pinos, California.' — This is an annotated list[1] of 94 species, based on the author's work as chief field assistant of the California Academy of Sciences, between May 1, 1903, and July 13, 1910, during which period "considerable time was spent in collecting water birds in the general vicinage of Point Pinos — Monterey Bay and the adjacent ocean." During most of these years Mr. Beck spent each year a number of months in quest of the water-fowl which frequent this part of the California coast during the fall, winter, and spring months, with the result that the Museum of the California Academy of Sciences has by far the most extensive collection of well-prepared specimens of these birds now extant. Mr. Beck's paper is a summary of the results thus obtained, and is hence a most welcome contribution to our knowledge of the winter distribution of these birds (Grebes to Plovers, both inclusive) along the California coast. The nomenclature is that of the third edition of the A. O. U. Check-List, except that subspecies are not recognized, so that we have the California Eared Grebe recorded as *Colymbus nigricollis*, the California Murre as *Uria troille*, and so on in all like cases.

Among the more interesting records it is noted that Xantus's Murrelet, although not now breeding north of Lower California, wanders north after the breeding season to Monterey Bay, where, in some winters, it is found in considerable numbers, it having been observed on nearly every trip from November 24, 1904, to February 4, 1905. It is also more than hinted that there is complete intergradation between *Brachyramphus hypoleucus* and *B. craverii*.

The Skua (*Megalestris skua*) is recorded as taken in Monterey Bay

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[1] Water Birds of the Vicinity of Point Pinos, California. By Rollo Howard Beck. Proc. California Acad. Sci., ser. 4, Vol. III, pp. 57–72. September 17, 1910.

August 7, 1907, and attention is called to a previous overlooked record for the California coast made by the late George N. Lawrence in Vol. IX of the Pacific R. R. Survey Reports (1858, p. 838). The specimen, formerly in the Lawrence collection, is still extant in the American Museum of Natural History. The species, however, is not recorded for the Pacific coast in any of the editions of the A. O. U. Check-List.

Larus canus is again recorded for California, but, as in previous instances, doubtless on a misidentification of *L. brachyrhynchus*, which is not given, though a common species on the California coast in winter.

It is interesting to note that a small breeding colony of the Least Tern is reported as occurring at Moss, near the mouth of the Salinas River. *Fulmarus rodgersi* is confessedly recorded as *F. glacialis*! In the A. O. U. Check-List (3d ed.) *Puffinus bulleri* is recorded as: "*Range.*— New Zealand; north casually to California." Mr. Beck says: "Ten specimens have been taken by me in fall off Point Pinos, double the number recorded from New Zealand seas in Godman's 'Monograph of the Petrels.'" The Black Petrel (*Oceanodroma melania*) was found at frequent intervals and specimens taken from May 27 to September 14, 1907, though apparently not previously recorded north of the Santa Bárbara Islands.

A species new to the North American fauna added by Mr. Beck is the Pink-footed Shearwater (*Puffinus carneipes* Gould), a bird not previously reported from the American side of the Pacific, of which Mr. Beck has taken ten specimens near Point Pinos, the first November 23, 1903, the second November 24, 1904, and others in February, April, June, August, September, and November, 1907.

Mr. Beck states that he has "freely incorporated" observations made by Mr. Loomis in his series of well-known papers on California water-birds, and a number of the species are given on this basis, so that while the present list is mainly a summary of Mr. Beck's own work, it also includes species found by Mr. Loomis that the author of the paper failed to meet with.— J. A. A.

Townsend's 'A Labrador Spring.' — This volume[1] is of general as well as of ornithological interest, since it treats of the country in its varied aspects — of fishermen and fur traders as well as birds and plant life — and the phenomena attending the quick transition from snow banks to flowers in the rapid progress of spring in high latitudes.

The captions of the ten chapters convey some idea of its varied contents, namely: A Labrador Spring (pp. 1–35), From Seven Islands to Esquimaux Point (pp. 36–63), An Acadian Village (pp. 64–82), The Courtships of Some Labrador Ducks (pp. 83–102), The Cruise of 'La Belle Marguarite' from Esquimaux Point to Natashquan (pp. 103–130), Three Modern Cartwrights (pp. 130–148), The Montagnais Indians (pp. 149–179), Wings and Feet in the Air and under Water (pp. 180–205), Some Labrador Trees (pp. 206–219), Some Labrador Rivers (pp. 220–250). Much of the ornithological matter had previously appeared in 'The Auk' (for April and July, 1909, and April, 1910), but the incidental and special references to individual species of birds which occur throughout the narrative portions of the work impart an ornithological flavor to much of the general text, while the nature lover and general reader will find throughout the volume matter of exceptional interest, presented in a spirit of sympathetic appreciation. The work is based on a five weeks trip in May and June, 1909, for recreation and study, and the author has been successful in rendering available to his readers a large share of the pleasure and intellectual profit of the journey. The fifty-six half-tone illustrations add greatly to the interest of the work, which is a worthy successor to the author's 'Along the Labrador Coast.' — J. A. A.

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[1] A Labrador | Spring | By Charles W. Townsend, M. D. | Author of "Along the Labrador Coast," etc. | With illustrations from photographs [Seal] Boston Dana Estes & | Company MDCCCX — 12mo, pp. xi + 262, with numerous half-tone plates. $1.50.

Hartert on the Proper Names of Various Species of British Birds.[1] — British conservatism in matters of technical nomenclature, especially in reference to British species of birds, has been incidentally the subject of remark in this journal on several recent occasions, in reviews of works dealing with British birds. Dr. Hartert, in the present paper, however, confines his attention to a few special cases, namely the correct names of White's Thrush, the Song Thrush and Redwing, the Black-throated and Eared Wheatears, the Black Redstart, British Wrens, British Dippers, and the generic names of the British Swallow and House Martin.

On grounds of priority, it is shown that the name of White's Thrush should be *Turdus aureus* and not *T. varius*; the Song Thrush should be called *Turdus musicus* (not *T. iliacus*) and the Redwing *T. philomelos* Brehm, and the British form of this species *T. philomelos clarkei* Hartert. The Black-throated and Eared Wheatears are declared to be only dimorphic forms of the same species; and that while hitherto known respectively as *Saxicola stapazina* and *S. aurita*, the proper name for the species is *S. hispanica* (Linn., 1758).

The name of the Black Redstart is changed from *Ruticilla tithys* to *Phœnicurus ochrurus gibraltariensis*, since *Phœnicurus* antedates *Ruticilla*, and the British form is a subspecies of the Caucasian *P. ochrurus*. The name *tithys* usually employed for the British bird, was based on a female of the Common Redstart (*P. phœnicurus*).

The British Wrens are considered referable to the genus *Troglodytes*, *Nannus* Billberg being regarded as too slightly different to be entitled to generic separation. Three British subspecies of *N. troglodytes* are recognized, and also two British subspecies of the Dipper.

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[1] Notes on Various Species of British Birds. By Ernst Hartert. British Birds, Vol. IV, No. 5, October 1, 1910, pp. 129–136.

The question of the generic names of the Swallows is of more than local interest. Hartert accepts Forster's division of the Linnæan genus *Hirundo*, namely, *Chelidon* for *H. rustica*, *Riparia* for *H. riparia*, and *Hirundo* for *H. urbica*, as was done by the A. O. U. Nomenclature Committee in 1886 and 1895. Later Sharpe assumed that Schæffer, in 1774, fixed the type of *Hirundo* as *H. rustica*, which view was later accepted by numerous authorities, including the A. O. U. Committee. Only within the last few months, however, has the present writer had an opportunity to examine Schæffer's work, and his treatment of the genus *Hirundo*. A careful study of this work makes it evident to us that he did not, in any true or acceptable sense, fix the type of *Hirundo* or of any other genus.— J. A. A.

Gladstone's 'The Birds of Dumfriesshire.'[1]—The avifauna of Dumfriesshire numbers 218 indigenous species, of which 56 are given as "very rare or accidental visitors," while 29 others are entered as of doubtful occurrence; 10 others are included as introduced species. The author has followed the classification and nomenclature of Howard Saunders, except in the case of geographical races, where trinomials and the nomenclature of Dr. E. Hartert are employed.

It is a very comprehensive work in all that relates to the manner of occurrence of the species of birds in Dumfriesshire. The general character of the presence of each is summarized in a line or two of small heavy-faced type as a sort of heading to the detailed account which immediately follows, with references in footnotes to the authorities on which the various statements in the text rest, when not based on the personal knowledge of the author.

The introduction includes short biographies of the ornithologists of Dumfriesshire (pp. xxv–xlii), a list of correspondents who have assisted the author in the work, an extended bibliography (pp. xlix–lxiii), a sketch of the physical features and climate of Dumfriesshire (pp. lxv–lxxvii), a few pages on bird migration as observed in the county, two pages on 'flight-nets' as used by fishermen in capturing wild-fowl, six pages on bird protection (including "The Wild Birds Protection Order" of 1908 for the County of Dumfries), a few pages of "local misnomers and names," and three pages on the number of species recorded for Dumfriesshire, and the method of their treatment in the 'Birds of Dumfriesshire," which occupy the rest of the volume (pp. 1–472). The illustrations include, besides a large folding map of the county (printed in colors to show contours of altitude), twenty-four finely executed half-tone plates, representing scenic features of the county, nests and eggs, and birds from life or from historic specimens. The volume is beautifully printed on heavy unglazed paper, and forms an attractive and important addition to the series of works relating to local faunas in the British Isles.— J. A. A.

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[1] The Birds | of | Dumfriesshire a contribution to the Fauna of the Solway Area | By Hugh S. Galdstone | M. A., F. Z. S., F. R. S. E., M. B. O. U. | President of the Dumfriesshire and Galloway Natural History | and Antiquarian Society. With illustrations from photographs by | Messrs. D. Legard, F. Barber-Starkey, the Author and others, and a map. Witherby & Co. | 326 High Holborn London 1910 — 8vo. pp. xcix + 482, 24 half-tone plates, and a folded map. Edition, 350 numbered copies. 25s. net.

Report on the Immigration of Summer Residents in England and Wales in the Spring of 1909.[1]— This is the Report (the fifth of the series) of the Committee of the British Ornithologists' Club on the spring immigration of the summer resident birds into England and Wales in the spring of 1909, and on migratory species observed in the Autumn of 1908. In respect to the species reported upon and in form of treatment the present report conforms closely to its predecessors, previously noticed in this journal, although containing about one third more pages, due mainly to a fuller treatment of the autumn records. The stream of spring migrants, while "fairly continuous," was at its height from the 9th of April to the 13th of May, with the usually large 'waves.' "The main immigration took place on the 9th, 17th and 25th of April, and on the 2nd–5th, 10th and 13th of May, the largest on the 17th of April, when the arrival of at least twenty species was observeed."— J. A. A.

Beetham's 'The Home-Life of the Spoonbill, the Stork and Some Herons.' — This is the second volume[2] of the "Home-Life" series, published by Witherby & Co., the first being Macpherson's 'The Home-Life of a Golden Eagle,' already noticed in these pages (Auk, XXVII, Jan. 1910, pp. 101, 102). The present volume treats of the Spoonbill, the White Stork, the Common Heron, and the Purple Heron. These four species were carefully studied and photographed from screens or blinds erected near nests, and the text and accompanying beautiful illustrations are an important contribution to the life histories of these species. The author takes us to the haunts of these birds, without however telling us just where he found them, but the setting and the allusions indicate, at least for three of the species, the marshes of Holland.

Of the Spoonbill the author says: "The manner of feeding was quite distinct from that of the cormorant-like birds, where the young thrust their heads far down their parents' distended gullets, for here the food was regurgitated into the top of the throat and the trough at the base of the lower mandible, whence the young could pick it out without their heads entering the throat at all." The closing paragraph of the account notes the "tone of gentleness" of these birds, and their "silent dignity," but adds: "True, to be exact, their silence is more a necessity than a virtue, since they are possessed of no true vocal organ, but it so befits their other actions that it may well be laid to their credit without too close examination."

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[1] Report on the Immigration of Summer Residents in the Spring of 1909: also Notes on the Migratory Movements and Records received from Lighthouses and Light Vessels during the Autumn of 1908. By the Committee appointed by the British Ornithologists' Club. = Bulletin of the British Ornithologists' Club. Vol. XXVI, October, 1910. Edited by W. R. Ogilvie-Grant. 8vo, pp. 347.

[2] The Home-Life | of the | Spoonbill | the Stork and some Herons | Photographed and described | by | Bentley Beetham, F. Z. S. | With thirty-two mounted Plates | London Witherby & Co., 326 High Holborn, W. C. | MCMX.— Large 8vo., pp. viii + 47, with 32 plates. 5s.

In the home-life of the Common Heron its checkered history is noted. In early times it was protected as royal game, but since the breechloader has ousted the falcon, he is no longer *protected* to be *destroyed*, but *from* destruction, since the angling fraternity are now "clamoring loudly for his blood."

Mr. Beetham's narrative is entertainingly written and adds greatly to our knowledge of the intimate home-life of these shy and interesting birds, while the beautiful photographic plates add a realism that no amount of word-painting can supply.— J. A. A.

Simon on the Hummingbirds of Ecuador.[1] — Ecuador is divided into three regions, (1) the low hot region between the Pacific and the western Cordillera, (2) the area between the two Andean ranges, and (3) the basins of the Rio Napo and Rio Pastassa. The characteristic forms of Hummingbirds of each are indicated and the ranges of various genera, as represented in the three districts, are commented upon. The list numbers 152 species, with notes on their ranges, and with pertinent technical comment. *Taphrospilus* is proposed as a new genus, with *Aphantochroa hyposticta* Gould as type; *Prasitis vitticeps* is described as new. The catalogue is a valuable contribution to our knowledge of the species of Hummingbirds thus far recorded from Ecuador and of their distribution.— J. A. A.

Gunning and Haagner's 'A Check-List of the Birds of South Africa.'[2] — The northern boundary of the area here included is approximately latitude 16° S., or "a line formed by the Cunene River on the east and the Zambesi River on the west." As said in the Introduction, Dr. Reichenow's 'Vogel Afrikas' is taken as the basis of the list, this being "the only complete modern work on African Ornithology, and as he has evidently bestowed much time and care on the subject of the nomenclature of South African birds. Where we have cause to differ from Dr.

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[1] Catalogue général des Trochilidés observés jusqu'a ce jour dans la Republique de l'Écuador. Par E. Simon. Revue Française d'Ornithologie, Nos. 17 et 18, Sept.-Oct., 1910, pp. 257–270.

[2] A Check-List of the Birds of South Africa, Being a record of all the species known to occur south of the Zambezi-Cunene line (the 16th degree of south latitude). By Dr. J. W. B. Gunning, President, South African Ornithologist's Union, and Alwin Haagner, F. Z. S., Colonial Member, British Ornithologists' Union, Honorary Member, Royal Hungarian Bureau of Ornithology, Honorary Secretary, South African Ornithologists' Union. Annals Transvaal Museum, Vol. II, July, 1910, Suppl., pp. 84.

Reichenow's conclusions we have added in the Appendix [pp. 75–84] explanatory notes; as is also the case with all additions to the Avifauna of South Africa since Mr. Sclater's Check-List was published."

The list begins with the family Struthionidæ and ends with the family Turdidæ. The names of families and genera are given and the authority and date of the latter and of species and subspecies, but the names of the orders are omitted. The technical names of the species and subspecies are followed by vernacular names, both English and Dutch, and a reference to Reichnow's and Sclater's works. Trinomials are used for subspecies, and the subspecies are numbered consecutively with the species, the numbers running to 920, with four interpolated numbers making a total of 924. No references are given to the place of description for either the genera or species, nor is the range given. The list is thus nearly the same in character as the American Ornithologists' Union 'new Abridged Check-List of North American Birds.'

We note that Brissonian genera are adopted so far as they occur in the South African avifauna, and are duly accredited to him, and that in only one instance is a genus wrongly ascribed to him, namely, *Emberiza*, which dates from Linnæus, 1758, and not from Brisson, 1760, although employed by Brisson independently of Linnæus, as was also *Vultur*, sometimes also wrongly assigned to Brisson. *Hydrobates* is employed as the generic name of the Storm Petrel instead of *Thalassidroma*. *Hydrobates* Boie, Isis, 1822, p. 562 (not *Hydrobata* Vieillot, 1816) contained two species, without designation of type. These are *Procellaria pelagica* Linn. and *P. leachii* Temminck. *P. pelagica* became the type of *Thalassidroma* Vigors in 1825, by original designation. This left in *Hydrobates* only *P. leachii* (Temminck 1820 = *P. leucorrhoa* Vieillot, 1817), which later became the type of *Cymochorea* Coues, and is congeneric with the type (*P. furcata* Gmelin) of *Oceanodroma* Reichenbach. Hence *Hydrobates*, if available for use, should replace *Oceanodroma*, and *Cymochorea* becomes a homonym of *Hydrobates*.

The nomenclature is in accord with modern rules, but in a few instances the names or authorities are not those commonly in use, the authority for *Riparia* being given as Vorst, 1817 instead of Forster, 1817 (probably a typographical error for Forst.), and *Delichon* Moore, 1854, is used for the House Martin instead of *Chelidonaria* Reichenow, 1889; and a few other departures from current usage are noticeable, but doubtless rest on good grounds.

Although the ranges of the species and subspecies, and references to original descriptions, are omitted, the list furnishes a handy up-to-date catalogue of South African birds, compressed into less than a hundred pages.— J. A. A.

Rubow's 'The Sea Gull.'—This is a brochure[1] of twenty-five beautifully executed half-tone illustrations and three pages of text, devoted to the life-history of the common Sea Gull of Europe as seen in Denmark. The series of illustrations begins with a mated pair of birds shown standing on a sea-girt rock; this is followed by views of a breeding colony on their nests; by single nests with eggs, amid natural surroundings; sitting birds on nests; nests with the eggs hatching; newly hatched young birds with the parent birds in attendance; young birds at a later stage of development; a flock of adult birds in the air over a field, searching for insect larvæ as exposed by a farmer in plowing; the series closing with views of small parties of gulls perched on rocks along a seashore or flying in the air. The text (in Danish) tells briefly the story so fully and beautifully illustrated in the plates. The brochure as a whole is exceedingly artistic, both plates and text being printed on heavy clear white plate paper, and bound in paper of a similar quality but of a pale blue-gray tint; the cover title is bordered with deep blue waved lines and the title printed in deep blue and black. Rarely have we met with a more pleasing and tastefully made ornithological booklet.— J. A. A.

Mathews's 'The Birds of Australia.'[2] — Volume I, Part 1, of this great work on Australian Birds was issued October 31, 1910. The work is published by subscription, by the well-known London publishers, Witherby & Co., and it is announced that "at least four parts will appear each year." The first part contains the Casuariiformes (5 species), the Galliformes (9 species), and the Turniciformes (7 species), or a total of 19 species, each illustrated. The first seven volumes (to form 30 parts), as announced in the prospectus, will carry the work to the Passeres, which, comprising some 450 species, will occupy Volume VIII and the succeeding volumes to the end of the series.

Since the completion of Gould's 'Birds of Australia,' in seven folio volumes (1841–1848, with five supplementary parts, 1851–1869), half a century ago, many species have been added to the avifauna, and a vast amount of new information recorded respecting the life histories and distribution of Australian birds. It is the purpose of the author of the present work to bring together as complete an account of each species as possible, availing himself of all published information as well as the results of his own personal observations, and the assistance of field ornithologists in all parts of Australia. Each species will be illustrated from drawings by the best bird-artists available, and the plates will be carefully hand-colored.

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[1] Dansk Fugleliv | Stormmaagen | (Larus canus) | The Seagull, Die Sturmmöve, La Mouette cendrée | Dens Liv i Billeder. Fotograferet efter Naturn | af | C. Rubow | [Seal] Gyldendalske Boghandel | Nordisk Forlag | Forlagets Bogtrykkeri | MDCCCCX — Large 8vo, title page, 18 half-tone plates, 3 pp. text (unpaged).

[2] The | Birds | of | Australia | By | Gregory M. Mathews | Member of the Australian Ornithologists' Union and the | British Ornithologists' Union | With hand-colored plates | [Vignette] Volume I. Part 1. | London: | Witherby & Co. 326 High Holborn W. C. | October 31st 1910 — Royal 4to, pp. 1–96, pll. (colored), i–xix. Edition, 300 numbered copies. Price, £2, 2 s. per part.

An examination of Part I shows that the character of the work as announced in the prospectus has been well sustained. Of the plates, it is enough to say that with one exception, all have been drawn by J. G. Keulemans, and the text is well up to date. The bibliographical references are reasonably complete and the nomenclature modern; there are keys to the genera and species, and the descriptions (in small type) are very full, including those of the downy chick (when known), as well as of immature and fully adult birds, and of the nest and eggs. This is followed (in larger type) by the general account of the species, including its literary as well as its life history, with copious extracts from standard authorities. The account of the Emu thus occupies ten pages, and that of the Mallee Fowl twelve pages, while a couple of pages suffices to tell the little that is known of several of the species of *Turnix*, or so-called quails, the life histories of which are still almost unknown.

Mr. Mathews seems to be well prepared for his great task, having lived all his life in Australia and been a devoted student of its avifauna. In 1908 he published a 'Hand-list of the Birds of Australia' as a preliminary to the present illustrated work, and is in touch with a large number of field ornithologists in various parts of Australia from whom he is constantly receiving valuable observations hitherto unpublished. He also has the hearty coöperation of Dr. Ernst Hartert of the Rothschild Museum at Tring, who will render important aid in the technical and historical aspects of the work.

The illustrations, it is announced, will be by H. Grönvold, J. G. Keulemans, E. E. Lodge, and other noted bird draughtsmen. The part now under notice is a guaranty of the excellent character of the work, and we wish the author every support and the success this immense undertaking surely deserves.— J. A. A.

Bird Enemies of the Texas-fever Tick and other Ticks.— Mr. Robert Newstead of Chester, England, who has made numerous specific, hence valuable contributions to economic ornithology, maintains his satisfying standard in some observations[1] on the enemies of Ticks in Jamaica. While Gosse,[2] Taylor,[3] Ober,[4] and others record the fact that the Tinkling Grackle (*Quiscalus crassirostris*), and the Parrot-billed Blackbird (*Crotophaga ani*) feed upon cattle ticks, with the exception of Ober, they content themselves with evidence derived from the testimony of others or from merely watching the birds. Newstead, however, by means of post mortems gives us definite information regarding the species and the numbers of ticks eaten. He briefly treats other items of food also.

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[1] Bull. Jamaica Dept. Agr., Vol. I, No. 3, 1910, pp. 161–165.

[2] Birds of Jamaica, 1847, pp. 284–285.

[3] Auk, IX, 1892, pp. 369–370.

[4] Proc. U. S. Nat. Mus., (1878) 1879, p. 193.

The contents of the stomachs of 6 Tinkling Grackles were analyzed by him; they contained ticks as follows: No. 1, 25 Texas-fever ticks (*Margaropus annulatus australis*) and 3 silver ticks (*Amblyomma cajanense*); No. 2, 74 Texas fever ticks; No. 3, 13 Texas-fever ticks; No. 4, 32 *Margaropus*; No. 5, 3 *Amblyomma* and 2 *Margaropus*; and No. 6, 7 *Margaropus*. The total number of ticks found in the 6 birds was 159. Newstead remarks that "as these were all females, it will be seen that had they been left to mature, that they would have produced between them over 1,000,000 eggs, or a corresponding number of young grass lice, so that the value of the Tinkling as a tick destroyer cannot be overestimated."

On several occasions the Parrot-billed Blackbirds or Anis were seen to take ticks (probably *Amblyomma cajanense*) from the heads of horses, and one Texas-fever tick was found in each of two collected stomachs of this species.[1] Domestic fowls also are said to feed on the cattle ticks to a marked extent.

Birds closely related to the Jamaican species above mentioned, namely the Groove-billed Ani (*Crotophaga sulcirostris*) and the Red-winged Blackbird (*Agelaius phœniceus*) are said[2] to prey upon Texas-fever ticks in Mexico. In Costa Rica also, according to Cherrie,[3] the Groove-billed Ani habitually feeds upon cattle-ticks. The habit is so marked in fact that they are called garrapateros in all Spanish American countries. Tick bird is in use in the West Indies and even the scientific name of the genus has reference to their obvious taste for ticks.

In the United States, Jackdaws (*Megaquiscalus major macrourus*) and Kingbirds (*Tyrannus tyrannus*) are recorded[4] as enemies of Texas-fever ticks. Mr. H. S. Barber informs me that he observed Red-eyed Cowbirds (*Tangavius æneus involucratus*), Boat-tailed Grackles and another species of Blackbird habitually attending cattle near Brownsville, Texas, and securing ticks by springing up from the ground and pulling them from the bellies of the animals. Sometimes the birds failed to get the ticks, but left their torn bodies attached to the skin. It was a matter of common knowledge that these bloody remains offered a favorable and oft used place for deposition of the eggs of the screw-worm fly (*Chrysomyia macellaria*). It is very doubtful, however, that any considerable proportion of screw-worm infestation takes place in this way. Eastern Cowbirds (*Molothrus ater*) also are said by Bendire[5] to eat ticks.

In the course of stomach examinations by the Biological Survey, the following birds have been found to eat ticks; those eating Texas-fever ticks are: Killdeer (*Oxyechus vociferus*), Upland Plover (*Bartramia longicauda*), and Meadowlark (*Sturnella magna*); net ticks (*Dermacentor occidentalis*): Dwarf Hermit Thrush (*Hylocichla guttata nana*); castor-bean ticks (*Ixodes* sp.): Boat-tailed Grackle (*Megaquiscalus major*), Meadowlark, and House Wren (*Troglodytes aëdon*); and *Gamasus* sp.: the Wren-tit (*Chamæa fasciata*).— W. L. McA.

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[1] The contents of all the stomachs here noted, as well as those of one bird of each species which had not eaten ticks, are very fully determined, and the economic relations of the various items given. Brief notes on the food of four other species of birds also are presented. They refer to *Centurus radiolatus*, *Platypsaris niger*, *Todus viridis* and *Tyrannus caudifasciatus*.

[2] Moreau, P. L. Circ. Num. 66, Com. de Parasit. Agr. Mex., 1907, figs. 8–9.

[3] Auk, IX, 1892, p. 325.

[4] Hunter, W. D. and Hooker, W. A. Bull. 72, U. S. Bureau Ent., 1907, p. 37.

[5] Life Histories of N. A. Birds, Part II, 1895, p. 435.

Economic Ornithology in recent Entomological Publications.— The greater prominence given to bird enemies of insect pests in recent entomological publications is a source of gratification to bird lovers. Increased recognition of the services of birds is common to both State and Federal entomological organizations, and in recent bulletins of the U. S. Bureau of Entomology, in particular, comment on the relations of birds to the insects discussed is seldom lacking.

Four papers on cereal and forage insects issued by the Bureau of Entomology during the present year include notes on birds in the discussion of natural checks of the insects treated. Fourteen species of birds, which the Biological Survey has found to feed on the clover-root curculio (*Sitones hispidulus*) are listed in Mr. V. L. Wildermuth's bulletin[1] on that beetle, and the statement is made that "natural enemies, such as fungous disease and birds, have without a doubt contributed largely towards holding the insects in check."

The clover-root curculio belongs to a genus of beetles closely related in appearance and habits, which do a large amount of obscure damage, principally to clover. Few genera of beetles occur more frequently in bird stomachs than *Sitones*. Six species are known to be eaten and *Sitones* unidentified as to species have been found in the stomachs of 49 species of birds. On account of the present more complete indexing of Biological Survey records ten species can be added to the list of 14 Wildermuth gives as enemies of *S. hispidulus*. The complete list is: Upland Plover, Killdeer, Ruffed Grouse, Broad-winged Hawk, Flicker, Nighthawk, Chimney Swift, Wood Pewee, Crow Blackbird, Meadowlark, Lincoln Finch, Song Sparrow, Chipping Sparrow, White-throated Sparrow, Purple Martin, Barn, Tree and Bank Swallows, Northern Water-Thrush, Catbird, Chickadee, Hermit Thrush, Robin and Western Bluebird.

The English Sparrow comes in for condemnation along with an insect pest in an article[2] by W. Harper Dean on the sorghum midge (*Contarina sorghicola*). Both the bird and the insect curtail the number of sound mature seed produced, so that in parts of many sorghum-growing States a profitable crop cannot be secured. The work of the sparrow is much less important than that of the fly. Sorghum heads partly destroyed by both agencies are illustrated (fig. 20). On page 57 of the same publication it is stated that a hummingbird (probably *Trochilus alexandri*) was seen hovering about the heads of sorghum and to all appearances feeding on the midges.

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[1] Bull. 85, Part 3, Bur. Ent., March, 1910, p. 37.
[2] Bull. 85, Pt. 4, Bur. Ent., May, 1910, pp. 39–40.

Mr. C. N. Ainslie [1] comments on the natural enemies of the New Mexico range caterpillar (*Hemileuca oliviæ*), a pest which has wrought steadily increasing damage for several years. Mr. Ainslie mentions seeing several Robins feeding on the caterpillars and adds (p. 95): "The importation of birds to feed on the caterpillars has been suggested, but in the infested regions the wide treeless plains afford but little encouragement for nesting birds. Besides this, it is a lamentable and criminal fact that in spite of laws that are designed for the protection of bird life in New Mexico, a constant and indiscriminate slaughter of all sorts of birds is in perpetual progress until the companionable species and those of high economic importance have been practically exterminated in many parts of the Territory. This condition of things may possibly account, in some measure, for this *Hemileuca* invasion, and may in the not remote future bring into prominence other insects now few and harmless, but multiplying because their bird foes have perished at the hands of hunters. This bids fair to become a serious matter, and not alone in New Mexico."

The store of information about bird food in the Biological Survey, the accumulation of 25 years of research, is again drawn upon for a list of the bird enemies of crane flies (Tipulidæ). The depredations of these insects range from local injuries in pastures and hayfields to the devastation of thousands of acres of grain crops and grass lands. Eighty-six species of birds are known to feed upon Tipulids and their eggs, showing a preference for these pests, that should be given substantial appreciation. "Among the birds which are known to feed upon the Tipulidæ, either as eggs, larvæ, or adults, probably the most important are the Wood Thrush (*Hylocichla mustelina*), the Alice Thrush (*Hylocichla aliciæ*), the Catbird (*Dumetella carolinensis*), the Robin (*Planesticus migratorius*), and the Crow (*Corvus brachyrhynchos*). Of the total stomach contents of 22 specimens of the Wood Thrush, examined at the Illinois State Laboratory of Natural History, 12 per cent was made up of tipulid fragments, while 11 specimens of the Alice Thrush contained 8 per cent of tipulid fragments." [2] An important publication of the Bureau of Entomology deals with 'Plant Bugs Injurious to Cotton Bolls.' [3] While no specific mention of bird enemies is made, space is given to a discussion of the prevalent idea that the offensive odor of bugs protects them from birds. "Without this supposition" the author says, "the object and origin of odoriferous glands may be difficult to explain, but studies in the feeding habits of insectivorous birds have shown that in most cases Pentatomid bugs are eaten at least to the extent of the proportion of their numbers to the numbers of other insects of the same and larger size. Further, it would seem that some birds, like the Crow, possess a predilection for insects of pungent or otherwise strong taste or odor. Careful studies have been made of the feeding habits of about 20 common American birds. Almost without exception Pentatomids (variously referred to as 'stink bugs,' 'soldier bugs,' and 'Pentatomids') are included in the diet of each of these birds, amounting on the average to about 3 per cent of all the food." The experience of the division of Economic Investigations of the Biological Survey is all to the effect that human criteria of taste can in no way be applied to birds. Failure in this respect has led to many fallacious statements concerning birds, one type of which relates to the bad taste of certain insects. None are more offensive to man than the stink bugs (Pentatomidæ). Nevertheless these insects are attacked by a great variety of birds and sometimes large numbers of them are consumed. Taking as a guide the amount of space occupied by cards in the Biological Survey food index, the Pentatomids are more relished by birds than any other family of Hemiptera and what is more surprising, than any family of Orthoptera which certainly rank as staple bird food. Dr. Morrill says: "Thus far no specific observations have been made for the purpose of determining the extent to which birds feed upon the conchuela [that is, *Pentatoma ligata*]. It is evident, however, that there is some important influence combined with egg parasitism to produce in midsummer the marked reduction in number of these insects observed both in Mexico and in Texas. The egg-parasites effectually check the multiplication of the pest after the month of July, but the diminution in numbers of the adults remains unexplained. In the laboratory, protected from their enemies, the life of the adult conchuela extends over many weeks, 27 specimens collected at Tlahualilo between July 6 and July 10 averaging over two months each.

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[1] Bull. 85, Pt. 5, Bur. Ent., June, 1910, pp. 93 and 95.

[2] Hyslop, James A. Bull. 85, Part 7, Oct. 1910, p. 129.

[3] Morrill, A. W. Bull. 86, June, 1910.

"It is inconceivable that the difference between field and laboratory conditions should be so great that, of the insects of the field on July 10, over 60 per cent should die from natural causes before August 1, while in the laboratory less than 5 per cent should die during the same period. Furthermore, if the numerical decrease in question had been due to natural exhaustion of vitality of the adult insects, it would be expected that many dead specimens would have been found in the cotton fields. As a matter of fact, dead specimens were exceedingly rare and the few found gave evidence of having been destroyed by some enemy rather than of having died from natural causes. As has been shown, the decrease in numbers is a general and not a local occurrence, and it takes place without regard to the abundance of food. These circumstances seem to point to the strong probability that birds are the useful agents in the reduction of the numbers of the adults of the conchuela."

Another supposedly distasteful insect, the yellow-bear caterpillar (*Diacrisia virginica*), became injuriously abundant in the Upper Arkansas Valley, Colorado, in 1909. H. O. Marsh, who investigated the outbreak says:[1] "A remarkable feature of this outbreak is that the larvæ had so few natural enemies. Birds did not eat them, and with the exception of a few individuals which were killed by parasites and disease they appeared to be unmolested." It should not be inferred from this that birds never eat these very hairy caterpillars. As a matter of fact the Bobwhite[2] and the Black-billed Cuckoo[3] are already recorded as feeding on them.

The Chief of the Bureau of Entomology, Dr. L. O. Howard, begins a new comprehensive series of publications on mosquitos with a bulletin entitled 'Preventive and Remedial Work against Mosquitos.' Ten pages are devoted to mosquito consumers such as salamanders, dragon-flies, predaceous mosquitos and fish. As this chapter discusses only the practical use of natural enemies of mosquitos, birds, not being susceptible to such use, are omitted. The fact that such a good general discussion of mosquito enemies other than birds is available, makes it desirable to give a hint at least of the number and kinds of birds that must be included in any complete survey of the natural enemies of mosquitos. In the report[4] of the Chief of the Biological Survey for 1908 the Chimney Swift (*Chætura pelagica*), Nighthawk (*Chordeiles virginianus*), Northern Phalarope (*Lobipes lobatus*) and Killdeer (*Oxyechus vociferus*) are named as mosquito eating birds. Other Biological Survey records are for Wilson's Phalarope (*Steganopus tricolor*), Pectoral Sandpiper (*Pisobia maculata*), Baird Sandpiper (*Pisobia bairdi*), the Bank Swallow (*Riparia riparia*) and the Wren-tit (*Chamæa fasciata*). John B. Smith states[5] that numbers of the larvæ of the salt marsh mosquito (*Aedes sollicitans*) were found in the stomachs of the Ring-neck Plover (*Ægialitis semipalmata*), the Least Sandpiper (*Pisobia minutilla*) and the Semipalmated Sandpiper (*Ereunetes pusillus*). In fact shorebirds in general seem to be especially fitted both by habits and tastes to be the most important enemies of mosquito *larvæ* among birds. Birds which feed on the wing naturally capture the most adult mosquitos. Such enemies include the Purple Martin (*Progne subis*),[6] Cliff Swallow (*Petrochelidon lunifrons*),[7] Bank Swallow (mentioned above), the Tree (*Iridoprocne bicolor*)[4] and Barn Swallow (*Hirundo erythrogastra*)[8] Chimney Swift, Whip-poor-will (*Antrostomus carolinensis*),[9] and Nighthawk. Stomachs of the Cuban Nighthawk (*Chordeiles virginianus minor*) examined by Allan H. Jennings on New Providence were distended with mosquitos.[1] The stomachs of a few warblers at the time were also full of mosquitos. Other birds recorded as consumers of mosquitos are Wood Pewee (*Myiochanes virens*), Phœbe (*Sayornis phœbe*), and Kingbird (*Tyrannus tyrannus*).[2]— W. L. McA.

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[1] Bull. 82, Pt. 5, Bur. Ent., Aug., 1910, p. 62.

[2] Bull. 21, Biological Survey, 1905, p. 45.

[3] Bull. 9, Biological Survey, 1898, p. 14.

[4] Ann. Rep. Dept. Agr., 1908, p. 577.

[5] Report on the Mosquitos of N. J., 1904, pp. 85–86.

[6] Port Jefferson, N. Y. Echo, Aug. 17, 1901.

[7] Merriam, F. A. Birds of Village and Field, 1898, p. 54.

[8] Forbush, E. H. Useful Birds and Their Protection [1907], pp. 345–346.

[9] Howard, L. O. Bull. 25, U. S. Div. Ent., 1900, p. 49.

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[1] Proc. Ent Soc. Wash., X, 1908, p. 61–62.

[2] Forbush. loc. cit., pp. 232, 235 and 238.

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CORRESPONDENCE.

The Extermination of the Wild Turkey in the State of Virginia.

EDITORS OF 'THE AUK':

Dear Sirs: — Recently in conversation with a friend, and Ex-Congressman, and one greatly interested in the game and game laws of the State of Virginia, I gained some reliable information in regard to the present status of the Wild Turkey in that section of the United States, which was a surprise to me, and may be to other ornithologists who have not of late especially investigated that subject. It is a well-known fact that many years ago in all the wilder and, for the turkey, suitable parts of the State of Virginia, this species was to be found there in great numbers. Indeed, it is well within my recollection when one had to go but a very short distance from Washington, D. C., into Virginia, in the forest regions, to find Wild Turkeys more or less abundant, and the hunters shot them there and brought them to the Washington Markets. My friend informs me that only fifteen years ago they were fairly abundant in Rappahannock County, less than one hundred miles from Washington, which is a division of the State where not one is at this writing to be found. What is true of Rappahannock County is probably more or less true for the entire State of Virginia, and as Virginia is a State that has not settled up very rapidly, the reason for the comparatively sudden disappearance of this bird there must be attributed to some other cause rather than to the encroachment of man on its domain, which cause invariably proves fatal to the existence of any wild form upon which he preys,— either for food or for other purposes. After fair and extended investigation my informant is of the opinion that the blame for the practical extermination of this magnificent American game bird in the region indicated is to be laid at the door of the negro who prowls through the forests of that part of the country. There the negro is essentially a savage and a squatter, living in a primitive cabin in the timbered sections, and existing upon what these forests afford him.

The male Virginia negro there has risen but very little above his African ancestors, and still possesses all of the undesirable qualities of the latter. If one passes through this wilderness, the former home of the Wild Turkey, he will, ever and anon, meet with one of these negro men. Solitary and silent, clad in his tattered garments, and carrying a primitive, single-barrel gun with its ammunition, he roams about like a veritable savage that he essentally is, seeking to slay any living creature that may afford him food, and mitigate the pangs of his almost ever-present hunger. He barely notices you as you pass him, and later on you may hear the boom of his big-bored fowling piece, perhaps nigh a mile away, and wonder to your heart's content as to the kind of animal he has slain.

At a time when the Wild Turkeys were rapidly disappearing in this part of Virginia and these solitary negroes roamed through her forests, they frequently passed through the better part of two or three days without a mouthful to eat. Especially was this the case in the spring-time when the few remaining birds undertook to breed. Persistent persecution at the hands of these negroes had apparently rendered the birds more and more secretive with respects to the sites they selected for nests wherein to deposit their eggs. This increased secretiveness, however, had but the effect of sharpening the wits of these negro prowlers for sustenance, and, frequently suffering from long-prolonged hunger, in every instance, sooner or latter, the much desired Wild Turkey's nest of eggs was discovered, and every one of the latter promptly consumed to appease his voracity. It goes without the saying as to what *must* happen if the eggs of any bird in nature be continually destroyed. But these negroes by no means stopped here, for if any one or more of these hen turkeys chanced to hatch out her brood, she was pretty certain to be met with by one of these merciless hunters, and fall a victim, chicks and all, to his rapacious appetite. So much for the criminality of this class of negroes and their lack of regard for the State game laws during the breeding season of the Wild Turkey.

When these fowls came to flock, or at the mating season, the ingenuity of these game destroyers,—these law-breaking negroes,—knew no limit. The places where the turkeys congregated or where they were in the habit of roosting, were easily discovered, and a most fatal design of trap was set for them in each and every locality. So simple, so inexpensive, so sure of result was the means employed to capture the birds at these times that their destruction was effected with great rapidity. They were simply baited, and baited in two ways, depending upon circumstances. For instance, let us select one of the many localities in the forest where the turkeys roosted in the trees, and where in the morning and early evening they fed and strutted and walked about on the ground, in the neighborhood. To capture them, these negroes employed only a very small fish-hook firmly attached to the end of a long piece of pliant, dark-colored twine, of sufficient strength to hold his victim. When the hook and line was set up in one of the roosting-trees it was baited with a soft piece of dough about the size of a small acorn. In the tree where the turkeys roosted, parallel limbs were selected, the one being some three or four feet above the other. Through previous observation the negro had become aware that a turkey was in the habit of roosting on the lower limb, and by running the twine over the upper one and suspending the bait where the bird could conveniently reach it, the remainder of the line was cunningly concealed through the tree and finally firmly fastened to a peg in the ground beneath. What follows is easily imagined, and hundreds of Wild Turkeys have been captured and killed by this simple affair. When the trap, if it may be termed a trap, is set on the ground the principle involved is much the same. Here, however, the bait employed is usually a grain of yellow corn made soft by soaking it in water so the barb of the hook can be readily passed into it and be at once effective after swallowing, and resistance follows by the turkey struggling to get free. This latter attempt is invariably defeated from the fact that the cord employed is so long that it allows the hooked bird to run about, without ever thinking to pull the long twine taut with the view of making the effort to tear the hook out, — an almost impossible feat at the best, especially if the bait has been entirely swallowed. Loose corn is always sprinkled around for several yards in all directions over the ground where the hook end of the string is set. This tends to deceive the feeding birds, and, sooner or later, one of them is pretty sure to pick up and swallow the one on the hook, and is at once made fast. Later on the negro will bag him by a knock on the head with the stick carried for the purpose. There is nothing to prevent baiting several localities in this way on the same day and evening, or setting several baits in any particularly good place where, in former times, a flock of turkeys were known to assemble.

With this brief account of the Wild Turkey's destruction in Virginia I close my remarks, and pass them over to our protectors of birds in this country.

Faithfully yours,

R. W. Shufeldt.

Washington, D. C.
31 Oct., 1910.

Concealing Coloration.

To the Editors of 'The Auk': —

Dear Sirs: — Now is the season for country readers of 'The Auk' to notice how the snow-covered roofs of houses match the sky, and are often all day, and generally all night, indistinguishable from the sky. Were men taller than these roofs, and were the snow confined to the roofs while the earth remained dark, they would see them against this dark ground and find them conspicuous just as they now do white birds, etc., that they commonly look *down* upon. Apparently naturalists are the only class of men who do not here recognize a principle that must of course apply to all white upward-facing surfaces seen against the sky. In England, in the Norfolk Broads, dark sails are now in use, because white ones did not show against the sky, and caused many collisions at night. (Dark sails are common in the harbors of many countries.) Yet, while these navigators thus show their knowledge of the invisibility of white against the sky, many naturalists still insist that white birds and other white or white-topped animals that need to be invisible against the sky are conspicuous from all view-points.

At the recent meeting of the A. O. U. I gave a short series of out-door demonstrations of the fact that the completeness of an animal's concealing-coloration depends upon his wearing samples of all the characteristic details of his back-ground. First I showed that a simple counter-shading conceals an object when it reproduces the one tone of a plain back-ground.

Then I introduced into this back-ground some white pebbles, until the spectator began to be able to detect the object by the extent of its eclipse of these pebbles. To restore its complete effacement I then gave its upward surfaces a few white spots that imitated the white pebbles of its back-ground, and instantly all suspicion of its existence was again removed. (All this is, of course, clearly set forth in our book.) Having thus called attention to this optical principle, I proceeded to show a typical example of its working in the vast class of species that are looked at by their prey or enemies against the sky, or *foliage with sky-holes through it*, and among whom upward-facing white markings are very common. Nature's wide-spread use of these white marks on aerial species is in startling contrast to the apparently total lack of them upon the vast world of species which, living away from water, dwell too low down, close to the ground, often to be looked at against the sky or sky-spotted foliage. My typical example was as follows: I showed a small stuffed deer placed just above the level of the eye and wholly indistinguishable, because, while his counter-shading reduced him to the uniform flat tone of the twiggery before and behind him, two bright white stripes running down his sides from his dorsal ridge, and a white spot on his head, absolutely passed for the sky seen through the flat twig element represented by his counter-shaded body, thus, as in the former case, perfecting the illusion. Not one of the two score or more spectators could detect the slightest difference between these counterfeit sky-holes and the neighboring real ones of the foliage back-ground, and of course not one of them, consequently, detected the deer, although each in turn stood within ten yards of him *and was shown exactly where to look.* For each spectator in turn I pointed right at the animal. They all agreed that it was the white sky-counterfeits that most completely prevented their detecting the deer. Ultimately I removed these white patterns, and the same spectators then easily distinguished the deer, although it occupied the very same place.

Upper surface white marks abound on aerial creatures and on such terrestrial ones as stand or leap high enough to have for their back-ground either sky or foliage with sky holes through it, and on all these species they work constantly the same magical effacement. Persons interested in this subject should read our book very carefully, as well as my letter to 'The Auk' of July, 1910, and my article in the 'Popular Science Monthly' for December, 1909. (I shall be delighted to send a copy of this latter article to any applicant.)

Let me add here a word about the flamingo to show how entirely his coloring belongs to the same class as that of all other sky-matching costumes of which my white striped deer was so convincing an example. (It is at least absurd to assert positively that the large denizens of the water he wades in, anacondas, alligators, etc., are not dangerous to him. C. G. Schillings found a goose in a crocodile's stomach.)

These birds are largely nocturnal, so that the only sky bright enough to show *any* color upon them is the more or less rosy and golden one that surrounds them from sunset till dark, and from dawn until soon after sunrise. They commonly feed in immense open lagoons, wading, in vast phalanxes, while the entire real sky above them and its reflected duplicate below them constitute either one vast hollow sphere of gold, rose, and salmon, or at least glow, on one side or the other, with these tones. Their whole plumage is a most exquisite duplicate of these scenes. Whenever any student of this subject comes to believe that any sky matching whatever, like, for instance, a deer's, is adaptation and not accident, he will not continue to be astonished that this flamingo, having at his feeding time so nearly *only* sunrise colors to match, wears, as he does, a wonderful imitation of them. The public will soon be astonished when I show them a dawn picture *made out of* the entire skin of one of these birds simply 'mosaicked' into the sky of a painting of one of their lagoons. I am now making such a picture. I have already nearly finished a picture of a Himalayan gorge made wholly of the skins of Monaul pheasants; and another one of a New Hampshire snow scene similarly done with magpies. Artists are positively amazed by both of them.

Two other points I wish to cover in this letter. The first is based on the obvious fact that the most critical moment an animal ever *survives* is that one in which he barely escapes death. Imagine a crouching hare stalked and at last sprung upon by a fox or lynx. If the hare bound away in time, the arc of the predator's leap inevitably brings his face *down to the very ground* at the spot which the hare has just left, and from this viewpoint the hare's rump is *well up against the back-ground patch-work of foliage pierced with sky-holes* so absolutely counterfeited by his own white rump and dusky flanks. (If most people refuse to take the trouble to put their faces to the sod and see for themselves they must simply trust what I say.)

My other point is merely a clear reiteration of the little noticed fact that matching the background does not always mean coalescing with what chances at the moment to be behind the animal. It means matching the *potential* back-ground; in other words, presenting such an appearance as the beholder's eyes would naturally expect to see in such a situation. It is especially important to understand this principle in such a case as that of the flamingo. Under his circumstances to be a picture of dawn or sunset whose rosy hues are the strongest characteristics of the place and the hour, could not make him conspicuous to the minds of his sub-aquatic neighbors. It is simply his best gamble.

A. H. THAYER.

Monadnock, N. H.,
Dec. 8, 1910.

NOTES AND NEWS.

Charles Otis Whitman, a Member of the American Ornithologists' Union, and an eminent teacher and investigator, died at his home in Chicago, of pneumonia, on December 6, 1910, at the age of 68 years. He was born at Woodstock, Maine, December 14, 1842. He was graduated at Bowdoin College in 1868, and received his A. M. degree from the same college in 1871. Afterwards he studied abroad, receiving the degree of Ph.D. from Leipzic University in 1878. In 1879 he was a Fellow at Johns Hopkins University, and Professor of Zoölogy at the Imperial University of Japan, 1880–81. He studied at the Naples Zoölogical Station in 1882, and was later Assistant in Zoölogy at Harvard University (1883–85), Director of the Allis Lake Laboratory (1886–89), Professor of Zoölogy at Clark University (1889–92), and head of the Department of Zoölogy and Curator of the Zoölogical Museum at the University of Chicago from 1892 till his decease. He was also Director of the Marine Biological Station at Woods Hole, Mass., from 1888 till 1908.

Dr. Whitman was a pioneer in developing modern methods of experimental research in zoölogy, and a leader in this field. To his ability and influence as a teacher and his resourcefulness in devising methods of attacking difficult problems in evolution many of the younger school of experimental biologists are greatly indebted for inspiration and guidance. He was also the founder and for many years the editor of the 'Journal of Morphology,' and was on the editorial staff of the 'Biological Bulletin' and other kindred publications. The results of his investigations were chiefly made known in his lectures on Biology (afterwards published) and in special papers. Among the leading subjects that occupied his attention are morphology, embryology, heredity, hybridization, and animal behavior. He devoted much time to the study of the evolution of color characters in Pigeons and to the natural history of this group of birds. He was elected to the National Academy of Sciences in 1895, and was also a member of the American Philosophical Society and the American Academy of Arts and Sciences, and the recipient of honorary degrees from various universities. A man of unusually attractive personality, he leaves a wide circle of friends to mourn his death, which is a heavy loss to science.

Manly Hardy, a well-known naturalist, and for many years an Associate Member of the American Ornithologist's Union, died at his home in Brewer, Maine, December 9, 1910, at the age of 78 years and 28 days. He was born in Hampden, Maine, November 11, 1832, an only son of Jonathan T. Hardy. Four years later the family moved to Brewer, Maine, and seven years later into the house on Wilson Street which has since been the home of the family, and has become so well known to many students of natural history through their visits to the subject of this biographical notice.

For a time Manly Hardy attended the common schools of Brewer, but was later a pupil in the private classes of the late Rev. George W. Field, D. D. At this early period of his life he contemplated a career in foreign lands as a missionary, but an injury to his eyes compelled him to abandon this desire; but he maintained throughout life a strong interest in religious work. With the development of ill health he sought the woods of his native State for recuperation, where he spent much of his time for many years, finally becoming an extensive fur buyer and large shipper of furs to foreign markets. This life brought him into close association with trappers and woodsmen, mainly Indians and "silent white men." Under such environment he acquired a keen insight into nature's secrets, and became an authority on the language and traditions of the Indians with whom he was thus brought into close association. For a time, in 1861, he was connected with the Maine State Scientific Survey.

In the words of a local biographer: "Early in life Mr. Hardy began to take a lively interest in the birds, but it was not till he was over 40 years of age that he began his collection. When in 1890 he gave up active business, he devoted more and more of his attention to adding rare and unusual specimens to what is regarded as one of the finest private collections of mounted and unmounted bird skins in the country." His collection, it is said, embraces nearly every species of North American bird, and numbers some 3,300 specimens, mostly mounted by himself.

His interest in wild life and his intimate knowledge of birds and animals brought him into close association with many prominent naturalists, among them being the late Major Bendire, to whose work on the 'Life Histories of North American Birds' Mr. Hardy contributed much valuable information, He was not, however, much given to making public record of his observations. Between 1878 and 1889 he was an occasional contributor to the 'Bulletin' of the Nuttall Ornithological Club and 'The Auk,' but his natural history communications were mainly published in 'Forest and Stream,' to which well known journal he was a valued contributor of natural history articles for nearly forty years. These were generally instigated by some erroneous statement by others in the columns of his favorite medium of communication, and with facile and vigorous pen he then drew freely upon his store of positive fact concerning the matters at issue.

Mr. Hardy was elected an Associate Member of the American Ornithologists' Union at its first meeting and he retained this membership till 1901. He was also a member of the Bangor Historical Society. He was held in high esteem by all who knew him, and his acts of charity and good-will will be long remembered by those whose good fortune it was to know him personally. His end came suddenly, although not unexpectedly, after little more than a day's illness. Of his five children still living, one, Mrs. Fanny Hardy Ecstorm, is well known to readers of 'The Auk' through her important contributions to ornithological literature.

It is with deep regret that we announce the serious illness of Mr. William Dutcher, President of the National Association of Audubon Societies, who was stricken with apoplexy at his home in Plainfield, New Jersey, on October 19 last. This was followed by a long period of unconsciousness and by paralysis of the right side. No complications having ensued, his physicians have hope of his continued improvement.

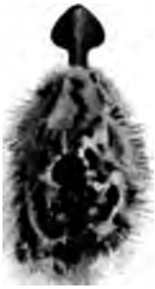
Mr. Roy C. Andrews, Assistant in Mammalogy at the American Museum of Natural History, has recently returned from a trip around the world in the interests of the Museum. He joined the scientific staff of the 'Albatross' in the Philippines in October, 1909, visiting during the next five months various parts of the Dutch East Indies. During this cruise he made an important collection of birds and mammals, besides obtaining much valuable anthropological and other natural history material. Later, after the close of the 'Albatross' cruise, he spent six months in Japan at the whaling stations, and secured skeletons of nearly all the species of large whales and of some of the dolphins that frequent the coast of Japan.

The American Museum of Natural History Stefánsson-Anderson Expedition to Arctic America left New York in April, 1908, for several years of research in zoölogy and anthropology along the Arctic coast, Dr. R. M. Anderson being in special charge of the zoölogical work. During 1909 they explored westward to beyond the Colville River, and in 1910 returned eastward to study the coast district as far as the Coppermine River. Notwithstanding many difficulties and much hardship, their work has been to a large degree successful. A few weeks since the collections made in 1909 have reached the Museum, and include several hundred bird skins, many nests and eggs, and a valuable collection of mammals, among which are good series of white sheep and Barren Ground caribou.

In the April Number of this journal (Auk, XXVII, 1910, pp. 241, 242) reference was made to the Kuser Asiatic Expedition, under the auspices of the New York Zoölogical Society, giving some account of its organization and purposes, and announcing the sailing of Mr. C. William Beebe and Mrs. Beebe for London, en route to India. They were joined in London by Mr. Bruce Horsfall as artist, and the party sailed direct for Ceylon. After several weeks spent in Ceylon, a visit was made to the Darjiling district of the Himalayas, and later to Borneo and Burma. Mr. Horsfall returned in August, 1910, but Mr. and Mrs. Beebe will remain till probably June or later of the present year, extending their work to Cochin China, and probably also to Formosa, Sumatra and Java. Thus far they have met with excellent success in obtaining specimens of the Pheasants of the regions visited, and in investigations of the life histories and ecology of the Phasianidæ, which are the primary objects of the expedition.

SEVERAL American naturalists are at present making collections of birds and mammals in different parts of Venezuela and other portions of northern South America, Mr. M. A. Carriker, Jr., being in northern Venezuela, in the interests of the Carnegie Museum of Pittsburgh and the American Museum of Natural History, and Mr. Wilfred H. Osgood in the interest of the Field Museum of Chicago; Mr. William B. Richardson is collecting in western Colombia for the American Museum, and the Academy of Natural Sciences of Philadelphia will soon have representatives in eastern Venezuela. Mr. S. H. Rhoads is also about to visit Ecuador to collect mammals and birds in the higher parts of the Andes.

FOR some time past a Biological Survey of the Panama Canal Zone has been under consideration, to be carried out under the direction of the Smithsonian Institution. The plans for the survey having now been matured, and the necessary financial support secured, several well-known biologists are already on their way to begin the work. The importance of such a survey is evident, the fauna and flora of the region being at present not well known, while it is certain that considerable changes must result from the completion of the canal, when the organisms of the various watersheds will be able to mingle, and existing biologic conditions be considerably modified. In order to determine the nature and extent of these changes it is necessary to secure full knowledge of the present fauna and flora. In carrying forward the survey the gathering of birds and mammals will be under the direction of Mr. E. A. Goldman of the Biological Survey; Mr. S. E. Meek, of the Field Museum of Chicago, and Mr. S. F. Hildebrand of the Bureau of Fisheries will have charge of the field work in connection with reptiles and fishes, and also make collections of mollusks and crustaceans; Messrs. E. A. Schwartz and Mr. August Busck of the U. S. National Museum and the Bureau of Entomology will be in charge of the entomological work, and other departments will be in charge of experts from other Government Bureaus. It is to be hoped that the survey will be well sustained financially, and the results of the work all that could be desired.



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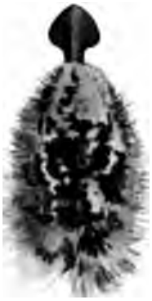

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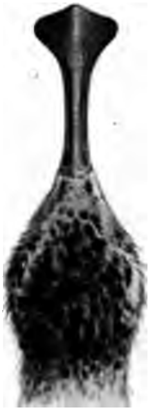

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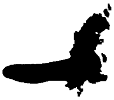

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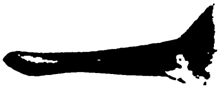

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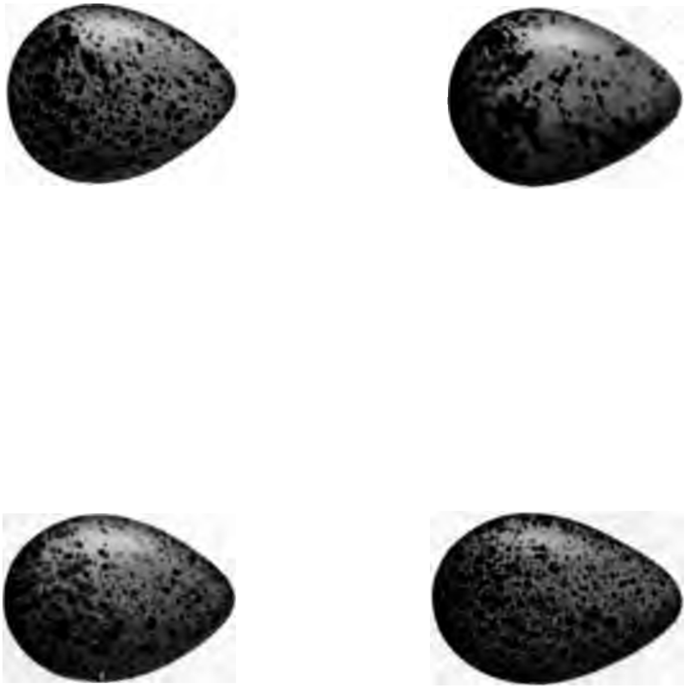
SPOON-BILL SANDPIPER

Figs. 1, 2, 4.—Bill of Newly Hatched Young.
Figs. 3 and 5. Bill of Adult.



EGGS OF SPOON-BILL SANDPIPER

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EGGS OF THE SPOON-BILL SANDPIPER (*EURYNORHYNCHUS PYGMEUS*).

BY JOHN E. THAYER.

Plates II and III.

Last spring I sent an expedition to Wrangel Island in charge of Mr. Johan Koren, with instructions to collect during the summer on the way up and to winter on the island, so that collecting could be begun as soon as possible in the spring of 1911. A vessel was purchased and a crew selected. They sailed from Seattle May 1. All went well until they encountered a terrible storm on May 13, which nearly destroyed the vessel. She was in such bad shape that it was decided to return and hire another boat. This was found impossible and Koren with two of his crew shipped on a trading vessel that was going to touch along the eastern coast of Siberia.

Mr. Koren thought he could land near Cape Serdze and find the nest of the Spoon-bill Sandpiper (*Eurynorhynchus pygmeus*), because he had collected a few specimens of this species in this locality the previous year; but the pack ice was so bad that the captain of the vessel was afraid to risk his ship and they had to turn back.

Captain F. Kleinschmidt, starting on a trading and collecting trip a week earlier than Koren, managed to get to Cape Serdze and had the good fortune to find the first nest and four eggs of the Spoon-bill Sandpiper. The parent bird, with the nest and eggs, was taken; also photographs. The nest was in the tundra, well concealed, especially so when the bird was incubating. Unfortunately this was the only set taken, as the season was advanced, it being then July 15. Captain Kleinschmidt took eight downies a few days old, which I have in my collection. The set of eggs was nearly incubated. The measurements are as follows: 1.20 × .92; 1.22 × .90; 1.20 × .88; 1.30 × .90 inches. I hope next year to collect many sets of this interesting bird as I shall send Mr. Koren to Cape Serdze in the spring.

The following is taken from a letter I received from Captain Kleinschmidt: "I was in hopes that I could get five or six clutches of the Spoon-bills, so I took all kinds of chances with my boat in the ice on the Siberian coast. I found, however, but one set of eggs and they were just ready to hatch.

"The male is the parent bird of the eggs, but the female belongs to neither eggs or downies, simply because the habits of this Sandpiper are similar to those of the Phalarope. The male has to stay at home, keep house and attend to the young, while the female thinks she has done all that is necessary by merely fulfilling the duties nature demands of her, namely the laying of the eggs. I shot the female in close proximity of the nest, but we never found a female with the downies. It was always the male. Although our observations were limited to but a few, still I believe the male solely attends to the hatching and the rearing of the young. The female also is larger than the male.

"The nest as well as the downies were found on the gentle slope of the tundra, bordering small fresh-water ponds. The nest was a rounded hollow in the moss, thickly lined with dry willow leaves. The downies blend so perfectly with the color of the moss that the closest scrutiny will scarcely reveal their hiding place. My pictures were not a success. I did n't have the adequate camera. I am sending you, however, two copies of each. On one I have traced the bird so you may find him in the other."

If this is true, that the male incubates instead of the female, it is extremely interesting. In looking over my series of fourteen skins, all adults, I find the females are larger and their mandibles noticeably so.

A most interesting fact is that the nestlings just hatched out of their shells, have perfectly formed spoon bills as seen in plate II. This must indicate that this species is a very old one.

The two plates are from drawings by Mr. E. N. Fischer. The figures are all natural size.

NEST LIFE OF THE SCREECH OWL.[1]

BY ALTHEA R. SHERMAN.

IN LARGE boxes put up for the accommodation of Woodpeckers lived the Screech Owls from whose nest lives these studies were made. It was in one of these soap-boxes, nailed against the trunk of a willow tree that the first of these Owls was seen on March 24, 1909; evidently it had been there in January of that year, as the feathers of a luckless Bohemian Waxwing remained to prove. A Screech Owl was seen to spend the day there again on March 30 and on April 2 and 18. On the morning of April 5 a rufous feather fluttering from the entrance hole of the west flicker-box in the barn betrayed the nesting place. The bottom of the box was covered with excelsior in which the female had scratched a hollow in the corner farthest from the entrance, where she was sitting on four fresh eggs. For six days the nest was closely watched and the following facts were ascertained. The meat-offerings brought by her mate and dropped through the hole for his divinity within consisted of a white-footed mouse on two of the mornings, and a Junco on two of them, while on the remaining two mornings nothing was there. On two evenings the female went out early before the nest watch began; on other two she went out after dark alone, and on two evenings her mate came after dark to the hole and called her with a very low cry, which once was answered by a low sharp note from the female, who on both evenings, almost immediately went out to join him in the search for refreshments. This little incident may be of interest to two classes of people, the sentimentalist and the evolutionist, who may be seeking the missing link between the Screech Owl and the young man who calls to take his lady-love out for ice-cream.

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[1] Copyrighted, 1911, by Althea R. Sherman.

The evening of April 10 was one of those upon which the female had gone out early before the nest was visited. A watch of more than two hours was maintained in order to learn the length of her absence from her eggs. In the meantime a violent wind storm sprung up, that continued all night and the following day, wrecking wind-mills and some buildings. Once the scratching of the bird's claws against the barn was heard, but she failed to come in, probably the fury of the storm prevented her making the home port; however it may have been, she did not return to her eggs, and the history of this nest was closed.

In the following June a nest-box was built into one corner of my blind in the hopes that it might serve an anxious pair of Flickers that were house-hunting. At the same time the future needs of the Screech Owls were kept in mind, as this new nest is just eighty-five feet from the box on the willow in which the male Owl had his head-quarters. The nest in the blind has a depth of twenty inches and a bottom area of eight by twelve inches. The bottom was covered with a thick layer of sawdust over which was spread a deep bed of excelsior. Very unfortunately for the most satisfactory sort of observations the top of the nest comes to the roof of the blind so that the two peep-holes from necessity were made in the sides. There is a hand-hole also, which is covered by a door.

In 1910 the Owls were not seen until the sixteenth day of March, when the male sat in his box on the willow, and the female with a mouse beside her in the nest in the blind, where the first egg was laid on March 27. Until that time came these birds were seen in their respective boxes on but four days. Meanwhile the box in the blind and the nest box in the barn showed signs of nocturnal visits by the scratched up condition of the excelsior in them.

The first egg was found in the nest on the morning of March 27, and was still alone on the evening of the 29th. The following day the nest was not visited, the only day in two months and a half, when visits were omitted. No doubt the second egg was laid some time on the 30th of March; the third one was deposited on April 1, but two days intervening between the laying of the second and third eggs, while three or more days were the period between the other layings. The fourth egg was in the nest at half past four o'clock in the afternoon of April 4, but was not there at eight o'clock on the previous evening. This shows that it took from eight to nine days to complete the clutch of four eggs. Whether the Owl laid in the night, or in the morning as other birds do, was not ascertained.

The blind, intended as a shelter while watching migrating birds, was built upon posts on a tiny plot of nearly solid earth in a small quagmire. In an air line it stands three hundred feet from the house, and nearly that distance back from the street. When the young Owls were almost ready to leave the nest they were freely exhibited to the neighbors, but previous to that time the existence of the nest was revealed to only a half dozen friends, who proved that six women could keep a secret. In its outside dimensions the blind is but forty-five inches square, hence when four of us entered it, the audience in the ceremony of viewing the Owls, like that of the Greek Orthodox Church, remained standing.

Such were the quarters and surroundings in which the study of the nest was conducted. It was generally visited several times during the day and at least once every evening; the time for the evening visits was usually an hour or two after dusk. Besides them there were two night watches that extended through the greater part of the night, one to half past two, and the other to three o'clock in the morning; and still another, begun after midnight, lasted over an hour. Once a lamp was burned for a few hours, during the rest of the long watches the time was spent in darkness. When an examination of the nest was desired it was illumined by a flash-light lantern. All pictures of these night watches must from necessity be silhouettes, easily drawn by the imagination of anyone. The only really exciting time was the evening of April 5, when a thunderstorm was raging; the rain beat hard upon the roof and sides of the blind, and the wind blew great gusts, which momentarily seemed to threaten the overthrow of my frail shelter. If there should be a fifth egg it was imperative that the fourth one should be marked that night, so for more than an hour the going out of the female was tremulously awaited.

The Owl of 1909 went out every evening and such procedure was expected of this one without fulfillment. Constant incubation appears to have begun on the first day of April after which she was frightened out on two evenings, one of them being the stormy night just mentioned. In order to count the eggs she was pried up with a stick thrust through a peep-hole. Out she would not go although her exit was anxiously awaited night after night until the thirteenth of the month, when once more she was frightened out in order that the eggs might be weighed. Then 248 grains was the weight of egg No. 1: 250 grains that of No. 2; 236 grains of No. 3, and 219 grains of No. 4. When fresh probably they weighed about the same as the eggs of the previous year, viz.: 252, 253, 255 and 261 grains, these figures being arranged in the order of their sizes. Just before it hatched egg No. 3 weighed 199 grains and No. 4 weighed 193 grains. The owlet from the last egg tipped the scales at 153 grains as it came from the shell. Eggs No. 1 and No. 2 were found to have hatched on April 27; No. 3 hatched the following night, and No. 4 about five o'clock in the afternoon of April 29, showing that the period of their incubation was about twenty-six days.

Unlike many other young birds newly hatched Screech Owls are in one of their most attractive guises. Covered to the tips of their toes with a thick white down, they appealed strongly to the hearts of the human mothers who saw them, and as one of them remarked the little owls "looked as if they had white socks on." As they tumbled about in their nest they very forcibly suggested human babies in fleecy white cloaks that are learning to creep. Held in the hand with their beaks downward and out of sight they looked like diminutive blind kittens; perhaps the most noticeable thing about them at that age was their large heads. But this winning aspect of the nestlings was of short duration. In a few days the pin-feathers began to show in the white down which soon turned to a dirty gray color. By the time they were twelve days old they had become most repulsive, exceedingly filthy to handle with an appearance that was decidedly repellant. Perfect miniatures were they of a doddering, half-witted old man: the blue beak was prominent and suggested a large hooked nose, while the down below it took the shape of a full gray beard, and that on the top of the head looked like the gray hair that covers a low, imbecile forehead: the eyes not fully open were bluish in color, and had a bleared and half-blind appearance. This loathsome semblance lasted no longer than ten days by which time the eyes were full and bright and yellow, the bird was covered with a thick gray down, and looked as if a fac-simile of it could very easily be made from a bunch of gray wool devoid of any anatomy. After this its aspect steadily improved as its feathery covering developed. All the young were of the red phase, as were both of the parents, the male being a deeper rufous.

A friend, a Southern lady, well known because of her writings on negro folk-lore, has written me that the negroes call this species of owl the Shivering Owl. Some ornithologists have suggested that this common name may have reference to the shivering quality of the bird's call-notes. It seems possible that ornithologists may have overlooked a characteristic of this species apparently familiar to many a pickaninny as well as to some bird-nesting boys of a lighter color, and that this owl may have been called the Shivering Owl, because it shivers. It certainly shivers, that it screeches may be a question for dispute. This peculiarity is one of the early things to be observed in the life of these nestlings; but the shivering does not become very pronounced until the bird is two days old, and continues until it is about two weeks old, at which time the young owl is well covered with thick down: therefore it seems quite possible that it shivers because it is cold. To this argument two facts lend weight, one is that the trembling diminishes gradually as the down grows thicker, and the other that the quivering bird sitting on the palm of one hand becomes quiet when well covered by the other hand.

The power of locomotion seems to be very good in young owlets; when one was but a day old it was placed on the floor of the blind where it moved the distance of a foot or more in a very few minutes. As soon as their eyes were fairly open they moved about freely in the nest. On May 3 the oldest owlets kept their eyes open a narrow crack, their lids were red giving the appearance of sore eyes: five days later they looked around as if "taking notice," this was the day upon which they first showed fear. When about three weeks old their manner of winking became a noticeable feature; catching a glimpse through the peep-hole of a human eye a youngster would stare as if lost in the deepest study, then close one eye in a deliberate long-drawn wink that was exceedingly droll, or in the same manner it would wink both eyes simultaneously which was not so amusing.

The light in the nest was about as bright as that in an ordinary room, that which entered through the three windows of the blind was greater than usually illumines house rooms. In neither place did the young show signs that the light was too powerful for their eyes. Only when carried into bright sunshine was there a blinking: most human eyes are similarly affected. The male Screech Owl often spent nearly the entire day with his head out of his box, in the full rays of the sun, his actions indicating that he quickly noted any unwonted movements. Unfortunately the hole of the female's box could be seen from exposed positions mainly, and not from the house. Twice only was she seen with her head out of her box, then I was more than a hundred yards away in the back yard of a neighbor, as I advanced toward the street into plainer view. she quickly scuttled out of sight. Several times during the daytime she accidentally was frightened from her nest, the directness with which she flew to a tree, then into the box of her mate showed no indications of poor vision. By day both she and her young were able to discover an observing eye when the peep-hole was closed all but the merest crack. A flash-light lantern was used nightly, its rays entering by one peep-hole while observations were made through the other; sometimes the lantern was introduced through the hand-hole and flashed within an inch or two of the mother's face. None of this appeared to excite fear, the light was utterly disregarded, but she at once would commence to sway and to peer at the human eye she detected in the gloom beyond. These things lead me to think that the eyes of this species are similar to those of the cat, capable of seeing well by day, also at night.

Except when disturbed the mother at all times appeared stupid, yet the young were as alert as most nestlings during the day. Until the shivering period was past they sought the warmth found under the mother's wings; after this as one would naturally suspect, they as do other young birds, continued to sleep much, standing in a bunch with their heads pressed together; they preened themselves but not so much as do some nestlings; frequently they yawned, monstrous, big-mouthed yawns. Stretching was the favorite exercise, during it the birds seemed to be made of india-rubber. On May 16 the height to which one stretched itself was seven inches by actual measurement. Sometimes they ate if food was before them, and always they exhibited a wide-awake interest in any eye that they espied looking at them through a peep-hole, even when the mother paid no attention to it. They would stare quietly at it for a time, then stare while their bodies swayed from side to side: this swinging motion would slowly come to an end, the performers would grow drowsy, two pressing against each other would lean their heads together and drop off to sleep. This pose was a favorite one a few years ago among photographers of human subjects. It may be needless to say that, it is much more artistic and charming when assumed by owls.

During their nest life but three varieties of cries were heard from them, the first, beginning as soon as they were out of the shell, had some resemblance to the peep of a chicken, and was uttered by them when out from under the mother's wings, seemingly a cry for shelter and for food: this ceased when they were about three weeks old. At this age a second cry was heard for the first time, which had a decidedly squeaking sound and was made when they were squabbling for the warmest place in the family circle. The remaining cry, a sort of chatter, appeared to be the tone for a dinner discussion, friendly enough in quality, for they were never seen to quarrel at meals. Besides these there was the snapping of the bill which commenced the day they began to show fear, and a hissing sound made when they were frightened.

The owlets were marked with different colored strings, and were weighed every evening about twilight, when an hour or more was spent in the weighing and in observations of them outside the nest. While removing them from the box a struggle generally occurred with signs of fear and the use of claws defensively, but not until three days before they left the nest did one make an offensive clawing attack upon my hand. While out of the nest aside from an occasional snapping of the bill they seldom showed signs of fight or fear, but allowed themselves to be patted and handled freely. Once one of them having exercised until tired turned its head to one side, laid it flat on the palm of my hand and went to sleep. For inspection they were placed on a stool over whose edges they frequently walked, but often saved themselves from falling by catching hold upon the edge with their hooked bills. Sometimes they arranged themselves along the edge of the stool, looking solemn and wise, then one would begin to sway, the others would join in the exercise, which was continued with the precision of a class in calisthenics. As soon as they could climb by using claws and bill a three-cornered shelf was the favorite perch for one of them, there immovably as a stuffed owl it stood until forcibly displaced.

The female Screech Owl calls to mind the village loafer who in describing his life occupation said that "sometimes he sat and thought, and sometimes he jest sot." In the case of this owl she "jest sot." During one of the long vigils — the one that lasted until half past two in the morning — there was a noise three or four times as of the eggs rattling against each other, and once she snapped her bill. This was all. Verily, a sitting Screech Owl is not a lively companion for the still watches of the night. After incubation began on only four occasions was the nest seen without her, two of these have been mentioned, the evenings on which she was driven out for the purpose of marking and weighing the eggs: on the other two she left voluntarily as the blind door was opened.

Her disposition was unreliable and created much trepidation and uncertainty as to the limit of inspection she would bear. One illustration of this was given on March 28 when she left her nest while her visitors were at the distance of six rods or more from the blind; again on May 1 there was another instance. Up to this time she had suffered the removal of her young from under her both in the daytime and in the evening, then it was the tossing of a common shrew into the nest that scared her out. This was at one o'clock in the afternoon, three hours later her young were stiffening with cold, but warmth furnished by the flame of a lamp and by the sun saved the nestling's lives.

The mother expressed disapproval of the examination of her nest by the snapping of her bill, the laying back of her ear-tufts, and the glare of her eyes, but never did she offer to bite nor to claw the hand. Once her leg, was seized by mistake for a nestling, and she uttered a cry of distress heard at no other time. Quietly she sat brooding her young for the first ten or twelve days after which the order was reversed and they stood upon her. Day by day she shrunk more and more from view until only an ear-tuft could be seen, then came a day when nothing could be seen of her, but she did not desert the nestlings in the daytime until May 26, three days before they left the nest. Those days she probably spent in the box of her mate where she was seen to take refuge when frightened from her nest.

It was impossible to learn how many of the days the male owl occupied his box, but from the date of the first egg to that upon which the young left the nest, sixty-four days, he was seen there on twenty-seven of them. Sometimes he did not show himself until evening: sometimes an unusual noise about the blind brought him into view. On other days he kept his head out of the hole almost all the time, going to sleep if all were quiet in the blind. When nest duties were not pressing his mate was seen to thrust her head out of her nest, as the holes of the two boxes faced each other many a Romeo and Juliet scene of an owlish character may have been enacted, and winks were exchanged beyond doubt. A few days before they left the nest the owlets began to sit in the hole and there seemed to be little time day or night when the hole was not occupied by one of them.

The male Screech Owl appears to have been the general purveyor for the family. In the first fortnight of incubation there were nine mornings when an excess of food lay beside his mate; of this she rarely ate during the day, but there were times when she did so. On the remaining days of incubation she had food beside her twice, but as soon as the eggs commenced to hatch there was a superabundance provided. An example of this was furnished on April 29 when there lay in store four meadow mice weighing about two-fifths of a pound altogether. This excessive provision lasted only a few days, the supply decreased daily, and none was seen after May 15. Nine o'clock, half past nine, and ten o'clock were hours upon which he was known to have brought food to the nest, eight o'clock in the evening being the earliest time. Twenty minutes before that hour he uttered his first call, after which were two other calls before his claws were heard on the roof overhead followed by continued calling; a sound like the mewing of young kittens was judged to be the answering voice of his mate.

On a few of their earliest days the owlets were weighed in the morning and at night, their increase in weight showing that they were well fed during the day. When the bird from the fourth egg was just hatched, its down being still wet, it was lifted from the nest. It opened its mouth for food and cried; at that time and afterward it was noticed that the young did not open wide their mouths nor throw their heads backward as do the nestlings into whose throats the food is poked, but while begging for food they thrust at the hand with a nuzzling motion very similar to that made by young kittens when searching for dinner. Bits of flesh clipped from meadow mice in store, that were placed in the mouth of a nestling, were swallowed with some difficulty and no apparent relish. Their beaks were stained upon the outside with bloody matter, and as they grew older they would nibble at the mother's bill as if teasing for food. All these things led to a belief that in their earlier days they were fed predigested or partially predigested food, which they pulled from the beak of the mother. After May 10 on only three mornings was any food found in the nest; from that date the mother sat with her bill in one corner of the nest, while the nestlings stood on her back, her wings and her tail. It was surmised that she sought this position to free herself from the teasing of her young. On the tenth an owlet was seen for the first time pulling at food (the body of a frog), as if eating it. The next morning during observations the mother lifted her head from the corner and appeared to eject something from her mouth; at once the owlets scrambled to the spot and seemed to eat for a few minutes. At that time a chance to view the nest from the top would have been most fortunate.

Although Father Owl failed on forty-one out of sixty-four days of nest life to provide a store of food for daytime use it does not follow that the nest was unserved. The food given to the sitting Screech Owl, and later to her young, consisted of moles, house mice, one white-footed mouse, two jumping mice, pocket gophers, ground squirrels, beef both raw and cooked, canned salmon, English Sparrows' eggs and their young, all of which was eaten or at least it disappeared. On May 13 the nestlings were seen eating eggs of the English Sparrow: two days later the oldest owlet was seen to eat portions of a gopher leg; holding the meat with one foot it tore off and ate a mouthful, then rested four or five minutes before eating again. On May 28 the youngest fledgling was watched while it ate the front leg of a gopher. Twice it tried to swallow the piece and was obliged to disgorge and tear off bits of the flesh, on the third trial the leg disappeared bone and all, the whole performance occupying upwards of twenty minutes. That fore leg had not been weighed, but its mate remained and was found to weigh 203 grains: the weight of the owlet that night was 1904 grains. To use a well worn illustration it was equivalent to a boy weighing ninety-five pounds eating at one meal a ten pound leg of mutton. The young Owls could not be induced to eat when outside of their nest. One evening while in the house they would not touch young English Sparrows offered them, but ate them the moment they were returned to the nest.

Pellets ejected by the young were found for the first time on May 10; it may be well to note that this was the first date upon which they were seen eating the food that lay in the nest. A pellet disgorged on May 27 weighed sixty-two grains, which was one-thirtieth of the weight of the bird that ejected it. No pellets from the mother's throat were found in the nest, yet once she was known to have remained there continuously for twenty-one hours. She seemed to have well defined ideas of house-keeping. Not always did the food dropped into the nest by her mate fall close to the wall beneath the hole, and the contributions to her larder that were pushed in through a peep-hole never fell there, but soon all was piled up in orderly shape against the north wall beneath the entrance hole, which seemed to be the normal arrangement until she was disturbed by the frequent opening of the hand-hole; she then changed her location to the north side of the nest and piled the game on the south side. One day the temperature rose to midsummer heat, and some of the excessive supply of food became exceedingly gamy and over-ripe. Discontinuance of the nest study was threatened, but in the night there was a clearing out of objectionable matter and such conditions did not recur. Nor did the plumage of the young become soiled. Their natural position in the nest seems to have been a standing one, this taken with the fact that the nest was made above a deep bed of sawdust may account for this cleanliness.

After the very sudden and unexpected going out of the mother bird on the first day of May she was not seen to leave the nest until the seventh evening of the month: from that date onward for a week she sometimes staid in the nest until part of the weighing was done, or if out, she came in and remained with her nestlings. On the 17th of May she did not go out when the owlets were removed from the nest although two of us were in the blind engaged in conversation, but she uttered a mournful, tremulous cry two or three times. After that in the evening she left the nest when the blind was visited. At times one parent would come to the windows, which at night were covered with heavy pasteboard shades, where it would cling calling to the young that were out of their nest. On a few nights a sound was made that resembled the chattering of human teeth. After the 18th of the month the expression of displeasure, displayed by the parents, grew more emphatic evening after evening. At first the demonstrations, made at a distance, were limited to snappings of the bill and a noise resembling the yelp of a dog: gradually feigned attacks on the person of the enemy increased in number and came nearer. The bird from some perch in a tree would describe an elliptical path in the air, coming with savage snappings until overhead and about ten feet up, it would utter one weird *eh-hue* cry before it swung back to its tree. In this long-drawn *eh-hue* note it was not so much what the owl said as the tone of voice in which it was said that engendered *cutis anserina* popularly known as "goose-flesh."

It was a keen disappointment that there were not more opportunities for the study of the food habits of the Screech Owls. In the forty pieces of game found in the nest there were eight birds, three frogs, one common shrew, and twenty-eight mice: the last named were chiefly meadow mice with two or three house mice. Enough of the meadow mice were weighed to ascertain their average weight to be upward of 600 grains. After leaving their nest on May 29, the oldest ones being thirty-two days old, the owlets were caught and kept in captivity several days. Their food was weighed and it was learned that when fed to satiety each one consumed meat equal in weight to one meadow mouse. This estimate may fairly indicate that the forty pieces mentioned were nearly one-eighth of the amount eaten by the entire family during the next season. On this basis of reckoning sixty-four birds fell victims to these night terrors; as but one of the eight birds seen was an English Sparrow little credit belongs to the owls on that score; four were Song Sparrows and three Juncos. After the Juncos had passed northward there were numerous reddish feathers in the nest indicating that Swamp Sparrows often appeared on the bill of fare.

The very large proportion of Song Sparrows and Juncos slain invites investigation. During some part of the nest period fully thirty species of small birds were present, of which Goldfinches, Vesper, Savannah, White-throated, Tree, Chipping, Field and Swamp Sparrows were as numerous at times as the Song Sparrows, or more plentiful, for in time all Song Sparrows disappeared. In three places on our grounds this species had been accustomed to nest, but as the days went by one voice after another was missed from the bird chorus. The fact that Juncos and Song Sparrows more frequently than their numerous congeners fell victims to these rapacious birds, suggests the thought that probably they flush at night more readily. Usually the head, wings and tail of a bird were torn off before it was dropped into the nest, only once was a whole one brought in. At times the food was marked; from this it was made certain that the body of a Song Sparrow lay untouched for two days, thereby showing that a mouse diet was preferred.

Out of forty pieces of game eight were birds or twenty per cent of the whole. Dr. Fisher's investigation of the food habits of this species shows that of 212 Screech Owls whose stomachs contained food 38 of them had eaten birds or eighteen per cent of the whole. This indicates that our owls were but two per cent worse than the species in general, yet their ravages were so great that it was decided if we desired a little bird paradise where all good birds were welcome through the summer time there Screech Owls could not be encouraged to remain, therefore the captive owlets were sent to a neighboring village, a pair of them to two invalid little boys in a hospital, the others to a friend in the same place. Soon all of them gained their freedom and with it the chance to prey upon all the little birds about them.

Weight of Owls, 1910.

Days in the lives of the Screech Owls.

Egg April 13 Hatching	No. 1 248 grs.	No. 2 250 grs.	No. 3 236 grs. 199 "	No. 3 219 grs. 193 "	Aggregate Weight	Daily Average
1	180	179				
2	221	218	174			
3	281	267	198	156	912	225
4	347	334	244	168	1093	273
5	422	410	296	186	1314	328
6	608	579	418	256	1861	465
7	705	670	552	346	2273	568
8	824	815	646	436	2721	680
9	994	920	820			
10	1006	1031	841	730	3608	902
11	1284	1077	1030	795	4186	1046
12	1184	1121	987	840	4132	1033
13	1421	1405	1190	1131	5147	1286
14	1414	1451	1416	1196	5477	1369
15	1695	1620	1531	1323	6169	1542
16	1573	1521	1445	1300	5839	1459
17	1682	1560	1431	1415	6088	1522
18	1714	1556	1505	1554	6329	1582
19	1917	1742	1721	1695	7075	1768
20	1870	1861	1844	1708	7283	1820
21	1930	1770	1746	1654	7100	1775
22	1954	1756	1740	1731	7181	1795
23	2010	1873	1706	1849	7438	1857
24	2105	1932	1856	1961	7854	1963
25	2301	2179	1980	2088	8548	2137
26	2395	1959	1948	2110	8412	2103
27	2119	1945	1841	2034	7939	1984
28	Not weighed					
29	2295	2040	1950	2180	8465	2116
30	2050	1789	1771	1940	7490	1872
31	2088	1835	1893	1895	7711	1928
32	2128	1970	1872	1904	7874	1968
33	2120	2043	1912	1860	7935	1983
34	2185	2109	1910	1964	8168	2042
35	2360			2145		
36	2645			2225		
37	2455			2250		
	Not weighed for 9 days					
47	2708			2471		

NOTES EXTENDING THE RANGE OF CERTAIN BIRDS ON THE PACIFIC SLOPE.

BY J. H. BOWLES.

AFTER a careful study of the new A. O. U. Check-List it seems to me probable that the following notes may be of interest to the readers of 'The Auk.'

All observations in the State of Washington were made in the western part of the State, mostly near Tacoma and Seattle in the vicinity of Puget Sound. The northeastern part of the State is represented by specimens from the vicinity of Newport, a small town near the Idaho border, which, together with those taken near Lake Chelan, make up the greater part of the records mentioned for the east side of the Cascade Mountains. A number of the Washington records appeared in the 'Birds of Washington,' by Dawson and Bowles.

The Santa Barbara, Cal., records, unless otherwise stated, were all based on specimens personally collected by myself. All specimens, unless otherwise stated, were prepared by myself and the identification made positive through the kindness of Dr. A. K. Fisher and Mr. H. C. Oberholser.

In my Santa Barbara work, I wish also to acknowledge here the unremitting efforts of Mr. Watson Snyder and Mr. E. S. Spaulding, who have spared no pains in locating new birds.

MARBLED MURRELET (*Brachyramphus marmoratus*).— Given in the Check-List as breeding "south to Vancouver Island."

These birds are regular residents on Puget Sound throughout the year, though less abundant in summer than in winter. In the waters surrounding Fox Island, a small island situated in the sound about ten miles from Tacoma, three or four to a dozen of these murrelets may be found any day during the summer. Although I have never heard of a nest being found, the additional fact that immature birds appear with the old ones during June makes it appear probable that they breed in the vicinity. From all that I can learn this is about as good evidence as we have concerning most of the breeding localities of this species.

Pacific Eider (*Somateria v-nigra*).— In 'The Auk' for April, 1906, Vol. XXIII, I recorded the occurrence of these birds in Puget Sound, as seen by myself, during January and February of that year.

My attention was first drawn to them by a local gunner who asked me to name a duck he had shot that was, "a good deal like a hen mallard, only about twice as big and with a very stout bill." He had secured it on the Nisqually Flats, near Tacoma, but unfortunately had devoted it to the pot. I at once visited the locality and was fortunate enough to see two female eiders feeding in a muddy slough. They allowed me a prolonged and excellent view, but flew too soon for a successful shot. A few days later, while crossing in front of these flats in a small steamer, the boat passed a magnificent male of this species, which allowed an approach of not more than fifty yards before diving.

Although no skins were secured, there seems no possible doubt as to identification. I believe this to be the southernmost record for these birds, and it must be most unusual, since I never saw or heard of any others during fourteen years' residence in the State.

White-winged Scoter (*Oidemia deglandi*).— Monterey, California, is the southern summer limit given in the Check-list for this species on the Pacific coast.

During the past summer of 1910 both Mr. Bradford Torrey and myself noted daily a flock of some fifteen or twenty of these birds close to the beach at Santa Barbara. Mr. Torrey says he saw nothing of them in the summer of 1909.

Bittern (*Botaurus lentiginosus*).— Breeding records for this bird in the State of Washington are rare, if, indeed, any have been yet published. The only instance that has come to my knowledge is kindly given me by Mr. D. E. Brown, of South Tacoma, Wash., who took a set of four eggs from Douglas County, Wash. The nest was placed on the ground in tall grass a short distance from a pond, the location being a large field instead of the customary swampy ground. The date was June 3, 1908.

Night Heron (*Nycticorax nycticorax nævius*). — Northern Oregon is given in the Check-List as the northern breeding limit for these birds. During early June of 1906 Mr. Dawson and I found these birds numerous on a chain of small lakes in Douglas

County, Wash. There was practically no doubt of a nesting ground in the vicinity, but unfortunately we were unable to locate it.

LITTLE BROWN CRANE (*Grus canadensis*).— Given in the Check-List as "casual west to California."

There is little doubt in my mind that a majority of the cranes seen in Washington west of the Cascades are of this species. I collected an adult male near Tacoma on October 10, 1909. I have no positive record for *Grus mexicana* excepting east of the mountains.

WILSON'S PHALAROPE (*Steganopus tricolor*).— I believe this Phalarope has been unusually numerous in the vicinity of Santa Barbara during the past summer of 1910.

July 22 is my first record, when two were together down on the flats, one evidently adult, the other probably young of the year.

On August 4 I saw three others, all in fall plumage, and on September 8 two more, of which I collected one. Between the dates given I saw frequently what were probably the same birds, but those given on the above date were most probably different individuals. Mr. Torrey saw these birds as well, and also has a record of a male and female seen April 30, 1909.

PECTORAL SANDPIPER (*Pisobia maculata*).— Given in the Check-List as, "In migration very rare on Pacific coast south of British Columbia, except in Lower California."

In the Puget Sound district of Washington this sandpiper is an irregular, but hardly a rare, spring and fall migrant. Some seasons it is almost or quite absent, while in others it is fairly common.

Hunting the Wilson's Snipe is one of my favorite sports, which may very possibly account for my seeing more of these sandpipers than the average observer. They frequent the same localities as the snipe, and I have several times seen as many as six or eight at one time scattered over an acre or two of wet meadow land. Incidentally they are so tame as to let a good dog "point" them repeatedly, much to the detriment of the sportsman's temper. I killed only a couple of specimens for my collection, but a hundred individuals would be an exceedingly low estimate of the number I saw during my fourteen years' residence in the State.

The experience of Mr. J. M. Edson at Bellingham, Wash., has been very similar to my own. He writes me: "Concerning the

Pectoral Sandpipers, I may say that I have taken at least eight specimens of this species on various dates between and including September 2, 1899, and October 10, 1908. On one date I saw as many as thirty or forty, and on another I noted about two dozen. Specimens were secured each time."

I have been here at Santa Barbara only during the past year (1910), but I noted this species once on April 14, for the spring migration, and twice in the fall, September 8 and 9. The last two dates may possibly represent the same bird, as I collected it and have seen no others since. Mr. Torrey also reports these birds for 1909 (see Condor, Jan.–Feb., 1910). On September 17 he saw one bird, two on the following day, and three on the 20th, all in the same place and within the city limits of Santa Barbara.

Killdeer (*Oxyechus vociferus*).— For the Pacific coast the Check-List does not give this bird as wintering north of California. It would perhaps be scarcely correct to go on record as stating that this species is a regular winter resident on Puget Sound, but in the vicinity of Tacoma it is seen so frequently at that season as to attract scarcely more than passing notice. I have seen them during all the winter months, although they cannot be found with any certainty. Beyond a doubt many do winter, mostly in good sized flocks that pass their time on one or another of the many different marshes and mudflats.

Snowy Plover (*Ægialitis nivosa*).— The Check-List gives Oregon as the northern limit for this species.

My brother, C. W. Bowles, took a specimen at Grays Harbor, Wash., which is now in our collection. The date was September 3, 1899, the bird being the only one of its kind noticed.

Mountain Quail (*Oreortyx picta picta*).— Given in the Check-List as occurring "from southwestern Washington south," etc. In the vicinity of Tacoma and throughout most of the Puget Sound country this quail is an abundant resident. Owing to different previous importations of both forms, occasional examples showing traces of *O. p. plumifera* are found, but *picta* is the typical form.

Sparrow Hawk (*Falco sparverius sparverius*).— Range given in the Check-List as "North America east of the Rocky Mountains."

There seems no reasonable doubt that this is the resident form in northwestern Washington. Specimens personally collected by myself near Tacoma several years ago were identified by Mr. Joseph Grinnell as typical *sparverius*. Also a specimen collected by Mr. D. E. Brown on September 11, 1910, near his home at South Tacoma, was identified by Mr. Oberholser as true *F. s. sparverius*. These birds are common summer residents, but not often seen during the winter months. I have never seen any birds in western Washington that I believe could be referable to *F. s. phalæna*, and doubt if this subspecies often drifts over onto the west side of the Cascade Mountains.

Saw-whet Owl (*Cryptoglaux acadica acadica*).— Not recorded in the Check-List as breeding in any of the Pacific coast States.

Mr. D. E. Brown took a set of four eggs of this owl, together with the parent bird, in the vicinity of North Yakima, Wash., on April 12, 1909. This was in an old nest of the Red-shafted Flicker (*Colaptes cafer collaris*), Mr. Brown having taken a set of the rightful owner from the same hole in 1908.

Richardson's Owl (*Cryptoglaux funerea richardsoni*).— Records of this owl are sufficiently rare in the United States to be of interest. Mr. D. E. Brown took a specimen near Bellingham, Wash., on January 17, 1905.

Ash-throated Flycatcher (*Myiarchus cinerascens cinerascens*).— Not recorded as breeding north of southern Washington. On May 23, 1903, on the outskirts of North Yakima, Yakima County, Wash., I watched one of these flycatchers building a nest in an abandoned hole of the Red-shafted Flicker. Being unable to wait for eggs, I examined the cavity and found that the flycatchers must have used the same site on the previous year, as an old and heavy mass of cow hair made evident.

These birds are exceedingly rare in Washington on the west side of the Cascades, the only record I have being of a pair I saw at Tacoma on May 21, 1905. These did not remain to breed.

Magpie (*Pica pica hudsonia*).— Not recorded as occurring west of the Cascades. The Magpie is a regular and not uncommon winter visitor to the tide flats and prairies in the vicinity of Tacoma. Occasionally I have seen as many as fifteen or twenty in a flock, but usually not more than half a dozen are seen together. Beyond a doubt they are voyagers over the mountains from their summer home on the east side of the Cascades where they are very plentiful.

LARGE-BILLED SPARROW (*Passerculus rostratus rostratus*). Given in the Check-List as wintering "from San Pedro southward along both coasts of Lower California," etc.

During the winters of 1909–10 and 1910–11 these sparrows were common on the dock at Santa Barbara, where they were seen regularly by both Mr. Bradford Torrey and myself. They arrive about the middle of September and leave us early in March, the attraction here being undoubtedly the grain that is spilled when the boats unload.

NUTTALL'S SPARROW (*Zonotrichia leucophrys nuttalli*).— Recorded as breeding south as far as San Louis Obispo County, Cal.

On May 21, 1910, while on a collecting trip near Santa Barbara with Mr. E. S. Spaulding of that city, he called my attention to two pairs of these sparrows. One pair was feeding some bobtailed young, evidently newly out of the nest, while the second pair showed every evidence of having a nest, although we failed to locate it.

Incidentally, a winter record of this sparrow from Washington may be of interest. On January 22, 1908, I collected near Tacoma a fine adult male in beautiful plumage.

GOLDEN-CROWNED SPARROW (*Zonotrichia coronata*).— While walking through a large field of weeds near Tacoma on December 16, 1907, I saw two immature birds of this species and collected one of them. Returning on January 15, 1908, I found the other bird was still there, where he remained until spring. These are my only winter records for this species.

SLATE-COLORED JUNCO (*Junco hyemalis hyemalis*).— Not recorded from the State of Washington. I collected a male of this species at Tacoma on February 4, 1909, and saw one other. They were feeding in the snow with a company of Shufeldt's Juncos (*J. h. connectens*), their plainer coloring at once distinguishing them among their western cousins.

SOOTY SONG SPARROW (*Melospiza melodia rufina*).— At Takilma, Josephine Co., Oregon, my brother, Mr. C. W. Bowles, collected the nest and four eggs of a Song Sparrow, but was unable to secure either of the parents. Returning to the same locality a few days later he succeeded in collecting a bird that was identified by Mr. Oberholser as most closely corresponding to *M. m. rufina.*

This is, of course, not sufficient proof for a breeding record, but it strongly indicates the possibility of a summer resident.

VALDEZ FOX SPARROW (*Passerella iliaca sinuosa*).— This new subspecies was recently described by Mr. Jos. Grinnell from specimens taken on the Alexander Alaska Expedition of 1908. The type, a male, was taken by Mr. J. Dixon, on August 26, 1908, at Drier Bay, Knight Island, Prince William Sound, Alaska.

I first saw this subspecies here at Santa Barbara on November 13, 1910, when I collected a female. Since then I have seen them here more or less commonly up to date of writing, December 31. I have taken other specimens on the following dates: a male November 18 and 23, and December 24. It is rather interesting to note that I saw none of these sparrows during the winter of 1909–10.

STEPHENS'S FOX SPARROW (*Passerella iliaca stephensi*).— On August 30, 1910, Mr. E. S. Spaulding, of Santa Barbara, secured one of these sparrows for me at Little Pine, one of the higher peaks in the hills of Santa Barbara County, the elevation being nearly 3000 feet. Mr. Spaulding reported them as being numerous but it was, of course, too late a date to ascertain if they nested in the vicinity. This, I believe, makes a farthest north record for this subspecies.

It may, perhaps, be of interest to state that Mr. Spaulding saw the California Pine Grosbeak (*Pinicola enucleator californica*) in the same vicinity where he took the *stephensi*.

FOX SPARROW (*Passerella iliaca iliaca*).— Although the title of this article does not, strictly speaking, apply to this case, another record of this sparrow in California may possibly be of some interest. On January 1, 1911, I collected a handsome male of this species here at Santa Barbara. It was in a mixed company of Golden-crowned Sparrows (*Zonotrichia coronata*) and Valdez Fox Sparrows (*Passerella iliaca sinuosa*), from which it was at once distinguishable on account of its much brighter plumage.

ANTHONY'S TOWHEE (*Pipilo crissalis senicula*).— Given in the Check-List as occurring "south of the San Bernadino Mountains and on the Pacific side of Lower California south," etc.

A towhee that I collected here at Santa Barbara on March 9, 1910, one of a pair, is identified as *senicula*. This I believe to be our breeding form. It seemed unnecessary to collect others during the breeding season as the very close examination that the other nesting birds permitted showed not the slightest variation from the specimen in hand.

During the coming winter I expect to collect others in order to ascertain if this is not the resident form, and whether or not *P. c. crissalis* occurs here at all.

WESTERN TANAGER (*Piranga ludoviciana*).— Recorded as nesting in southern California only in the high mountains.

Although the elevations where I have seen them at Santa Barbara were at most only 600 feet, these tanagers might be found at any time during the summer of 1910 in the little cañons just outside of town. They were undoubtedly breeding, although lack of time prevented my locating a nest in the dense live-oaks which they frequented.

PURPLE MARTIN (*Progne subis subis*).— Given in the Check-List, "North and South America, except Pacific coast region."

The martins found in the vicinity of Tacoma and Seattle are all unquestionably of this form. I felt convinced of it when I first saw the living birds, and a female taken by myself at Tacoma was identified as typical *subis*. They are rather common summer residents, breeding entirely in buildings in the business portions of the cities, so far as I have seen. It seems more than probable that this is the form to be found throughout northwestern Washington, but just how much further south is still uncertain.

RED-EYED VIREO (*Vireosylva olivacea*).— Not recorded as occurring on the west side of the Cascades.

Although a rather common summer resident in eastern Washington, it is only during the past few years that I have noticed this vireo west of the Cascades. I have recorded them once during migration in the vicinity of Tacoma, but the only locality where I have found them regularly is around the outskirts of Seattle. Here for the last few years it has been a not uncommon summer resident. I have seen several nests containing young or eggs, all of which were found by Miss Jennie V. Getty, near Kirkland, a suburb of Seattle.

ORANGE-CROWNED WARBLER (*Vermivora celata celata*).— Not recorded in the Check-List from the Pacific States.

It seems possible that this warbler is much more commonly distributed along the Pacific coast than is generally supposed. I collected a specimen at Tacoma on May 8, 1907, that was identified by Mr. Oberholser. Concerning this bird my notes say: "I saw eight of them during the day." Before and since that date I have seen a few birds every season — spring and fall — that I am positive were this species, their duller coloration making them almost conspicuous among the brighter *V. c. lutescens.*

LUTESCENT WARBLER (*Vermivora celata lutescens*).— Recorded as breeding in southern California only in the mountains.

This warbler is a rather abundant summer resident at Santa Barbara, where I have found the nest only two miles back from the ocean, the elevation being less than 400 feet. It is less numerous during the winter months.

SIERRA CREEPER (*Certhia familiaris zelotes*). — Not recorded in the Check-List from north of Oregon.

This subspecies is a not uncommon summer resident in northern Washington east of the Cascades, a breeding specimen taken by Mr. Dawson and myself being identified by Mr. Oberholser. It is to be found in the vicinity of Lake Chelan at the mountain end, and in the northeastern part of the State along the Pend d'Oreille River.

CREEPER (*Certhia familiaris*, subsp.). — The Check-List does not mention any form of creeper as occurring on the coast of southern California.

For the present record I am indebted to Mr. Watson Snyder, who located one of these birds for me here at Santa Barbara, and which we collected on January 5, 1911.

Mr. Oberholser informs me that the specimen is not precisely referable to any of the specimens in the National Museum, although more closely approaching the Sierra Creeper (*Certhia familiaris zelotes*) than any other. It was taken in a clump of live-oaks close to the town, at an altitude of about 700 feet.

SLENDER-BILLED NUTHATCH (*Sitta carolinensis aculeata*). — Recorded in the Check-List only in "Pacific coast region." *S. c. nelsoni* is the form given in the Check-List as occurring from the eastern base of the Cascades eastward. This is very possibly the case as regards central and southern Washington, but I do not believe it to apply to the northern part of the State. In the region of the Pend d'Oreille River, in northeastern Washington, we found *aculeata* to be the summer resident, a breeding specimen taken by Mr. Dawson and myself being identified as such by Mr. Oberholser. It therefore seems fair to presume that this is the form occupying the entire northern border of the State, as well as the Pacific coast region.

Chickadee (*Penthestes atricapillus atricapillus*). — A breeding specimen, taken by Mr. Dawson and myself near Newport, Wash., was identified as more nearly approaching this form than any other. They are common in that locality where, it may be well to add, we saw nothing that we thought to be the Long-tailed Chickadee (*P. a. septentrionalis*).

California Bush-Tit (*Psaltriparus minimus californicus*). — Given in the Check-List as not occurring in California on the "coast strip."

This subspecies would appear to be the breeding form of Bush-Tit found in the vicinity of Santa Barbara, since one of a pair taken by me on March 10, 1910, was identified as *P. m. californicus.* It is quite probable that *P. m. minimus* occurs here during migrations; in fact, I am positive that I have seen much darker examples during the winter.

Townsend's Solitaire (*Myadestes townsendi*). — What I believe to be the most westerly breeding record for this species was made just outside the city limits of Seattle, Wash., by Mr. D. E. Brown. The locality is, of course, not at all mountainous. The nest was placed in a slight cavity in a cut-bank, and contained newly hatched young on June 3, 1907.

Wren-Tit (*Chamæa fasciata fasciata*).— Given in the Check-List as occurring as far south as the "southern shores of San Francisco Bay and adjacent Santa Clara Valley."

On February 18, 1910, I collected here at Santa Barbara a female of what appeared to me to be an unusual *Chamæa* for this vicinity. Mr. Oberholser recently identified it for me as typical *C. f. fasciata,* and I am positive that I have seen others here of the same type.

Ornithologists of much greater experience than myself have given the Pallid Wren-Tit (*C. f. henshawi*) as the breeding form for this locality, so it is possible that this family of birds may be migratory to a considerably greater extent than is generally supposed.

CONCEALING COLORATION AGAIN.

BY THOMAS BARBOUR AND JOHN C. PHILLIPS.

MR. ABBOT H. THAYER'S book on 'Concealing Coloration,' and his various contributions to the subject which have appeared published in scattered articles, have awakened an interest in this fascinating field of observation which has never been known before this time. If Mr. Thayer's notices had been confined to studies of countershading, which he has so excellently demonstrated, and of similar phenomena, we should have been glad to subscribe most heartily to the immense importance of what he has shown us. Mr. Thayer, however, along with most other enthusiasts in a field with which they can be but partially familiar, has gone too far and claimed too much.

In his book we have the view elaborated that all organisms, or nearly all, are adapted exclusively as far as external features go to concealment in the environment in which they are found. Mr. Thayer does not even touch on the evolution of color and patterns. He simply says (page 36), "We ourselves attribute all such work (meaning here color patterns and normal backgrounds) to natural selection, pure, simple, and omnipotent."

Of the several notices which have appeared reviewing Mr. Thayer's work, only two have been in any way critical. Messrs. Dewar and Finn, on page 184 of their book, 'The Making of Species,' comment at length, saying "even as Wallace out-Darwins Darwin, so does Mr. Abbot Thayer....out-Wallace Wallace. That gentleman seems to be of opinion that *all* animals are cryptically, or, as he calls it, concealingly or obliteratively colored. Even those schemes of color which have hitherto been called conspicuous are, he asserts, 'purely and potently concealing' when looked at properly, that is to say, with the eye of an artist." They continue, after taking up one or two of Thayer's special cases: "There is something in this theory of obliterative coloration. Anyone can see, by paying a visit to the South Kensington Museum, that an animal which is of a lighter coloration below than above is less conspicuous in a poor light than it would be were it uniformly colored.... To this extent has Mr. Thayer made a valuable contribution to zoölogical science. But when he informs us that obliterative coloration is a universal attribute of animal life, we feel sorely tempted to poke fun at him. We would ask all those who believe in the universality of obliterative coloration to observe a flock of rooks wending their way to their dormitories at sunset."

Mr. Roosevelt, in Appendix E of his 'African Game Trails,' has disposed effectually of the dicta regarding the invisibility of the giraffe, zebra, and a host of other conspicuous beasts which have only to fear destruction from animals that hunt by scent alone.

Without any desire, however, to poke fun at Mr. Thayer, we may now consider a few of his important cases. We do this seriously, knowing full well that we see not with the eye of an artist, and that we shall probably be more pitied than blamed for what we write. We are, however, far from convinced as to how valuable an attribute this artistic eye really is; and are inclined to wonder whether, from a scientific point of view, a more open-minded conservatism would not be more persuasive in the end.

When Mr. Thayer says: "The color relations of earth, sky, water, and vegetation are practically the same the world over, and one may read in any animal's coat the main facts of his habits and habitat without ever seeing him in his home," it is in just this sort of thing that he has gone furthest wrong. The Peacock which he depicts merged in a jungle of varied greenery and blue sky is, as every field naturalist who has seen the Peacock at home well knows, a bird quite as often of the open fields and bare hillsides as of the jungle. The bird, for all his supposed protective mimicry, is safer in the open land, or sitting, as one so often sees him, on the dry top of a dead tree. Here he can see clearly all about him, better than if he were in the jungle, where prowling beasts of prey might follow him by scent — which they probably do far more often than by sight — and so quite easily find and destroy him.

Again, Birds of Paradise are shown in Plate VI as disporting themselves in a forest of waving palms, and amidst a general environment which it is hard to believe a visitor to the jungle has ever drawn. In Papua the male Birds of Paradise may usually be seen,— and heard too,— from bare tops among the tallest forest trees. They may be followed and discovered with the greatest ease, and make no efforts at concealment by placing themselves in the proper position, or by remaining motionless so as to deceive one, as do Bitterns, for instance, which use a real protective coloration. The females, of course, as has always been known, are inconspicuously colored; and for this reason they are difficult to observe.

We would protest gently against the slightly patronizing way in which the effective concealment of many birds is pointed out which has been known and recognized since ornithology began to be studied at all. There is nothing new in the statement that the Woodcock, or any of the horde of Grouse and their allies, have taken on a color which affords them excellent protection. In the Amazonian forests and elsewhere in Tropical America, snow-white Cotingas occur, which coloration might, to be sure, be useful in the Andes; but, when it is accompanied by the characteristic voice of the Campañero, it is hardly concealing.

The Flamingoes which we find in Mr. Thayer's book depicted as rosey clouds floating against the sky at sunset would, it seems to one who is not versed in optics, but who has seen Flamingoes, more probably appear as dark blotches against this same sky, when seen by an animal in the water in which the Flamingoes may be standing. The crocodile approaching one of the birds from the westward at evening would, we should imagine, be unlikely to see the Flamingo tinted rosily, but rather as a body cutting off the light rays from the afterglow; and such a body might be tinted any color, and still appear dark. Seen from the opposite direction it would be the only pink thing in the sky. Flamingoes hardly need this carefully arranged protection that is of value but a few minutes each day, and to be sure we see the curious cloud arrangement depicted on but very few days of the year — if ever. As for food, small gastropod molluscs, the sole food of the Flamingo, are not shy; and may be taken easily by any bird that feeds on them, whatever the color of the bird may be. Over the greater part of the American Flamingoes' range, at any rate, the anacondas and alligators of which Mr. Thayer speaks are not dangerous to him. In the Bahamas there are none of either of these enemies; and crocodiles are very scarce, and anacondas non-existent, throughout the whole

West Indian area. The two species of Andean Flamingo— *Phœnicoparrus andenus* and *P. jamesi* — as well as also *Phœnicopterus chilensis*, would be even less likely to meet with enemies of this sort. This leaves only the small African Flamingoes, *Phœniconaias minor* and *Phœnicopterus roseus* to be mentioned. Of course there are no water snakes in the Old World capable of swallowing a flamingo, and crocodiles would be dangerous over only a comparatively small part of the range of these birds. So that taking the group of Flamingoes as a whole, and their geographic distribution as a whole, we see that these two elements of danger would only be likely to affect a couple of species, and that over only a small part of their range. This is assuming that there are Flamingoes which would not *see* the coming enemy first, which is very improbable indeed. The fact that Flamingoes, Spoonbills and Scarlet Ibis lose the pink of their plumage almost at once with change of food in captivity shows that this characteristic is probably not one which has been fixed by organic evolution but is, as is probably often the case, a purely physiologic result from their mode of life.

This same method of analysis might be followed out for many of the other examples which Mr. Thayer uses. It is somewhat enlightening to match the Flamingo and the Roseate Spoonbill drawn in Plate IX with actual skins of the species. One would hardly believe it possible that they could have been drawn from specimens.

Mr. Thayer has devoted a number of pages (66–71) to the consideration of the exquisite plumage of the Wood Duck, in which he discovers a veritable picture-puzzle of water, forest-pools, cow-lily flowers, grass, reflections, window effects due to speculum, etc. In other words, the plumage is said to be "ruptive," "counter-shaded," "secant-marked," etc.

We must say that we admire the Wood Duck, we hope as much as Mr. Thayer does. We have seen him wild from New Brunswick to Florida, and have bred him in captivity in some numbers. Perhaps our imagination is at fault, perhaps our artistic education has been somewhat neglected; but we are content to look upon *Aix sponsa* as a beautiful bird with a strongly developed and pleasingly constructed dimorphism of plumage.

Mr. Thayer has made this duck the subject of some beautiful plates. We should like only to call attention to the fact that during nearly the whole season of greatest luxuriance of aquatic foliage the male Wood Duck, and other species as well, assume a nearly perfect "eclipse" plumage. The feathers are most brilliant during the late autumn, winter, and early spring, when their surroundings are of a dead and monotonous color. Hence, if we attributed any protective importance to such color patterns, we should be inclined to consider this of distinct disadvantage.

We believe the Caprimulgidæ, to take one of Mr. Thayer's first examples, to be a family with wonderfully adapted coloration. But here again we cannot but emphasize the enormous value of habit, which seems to us of far more value than color. We have, for instance, found a new white tennis ball an exceedingly difficult object to find, even in short grass; and chiefly for one reason — its habit of keeping still; yet we know approximately where to look for it.

It must seem that the premise which claims that this subject is one eminently fitted for investigation by an artist, and that it has wrongly been considered a part of the zoölogist's province, would need some revision. We are told that "it has waited for an artist in the last years of the nineteenth century not only to recognize the basic working laws of protective coloration, but to perceive that the many animals of supposed conspicuous attire are almost all colored and marked in a way most potent to conceal them." It would seem almost necessary that the painter should have a really wide knowledge of the varying forms and colorations of organisms of several classes of the animal kingdom before such broad statements were made. We have been shown in many cases that the female of a species having one type of coloration is protectively colored; and again that the male of the same species, with perhaps an enormously different type of coloration, is protectively colored also. We get, however, no suggestion as to how this was brought about. We must assume that primitive birds, indeed all birds, started originally with similarly colored males and females. The coloration of the Black Duck as compared to that of the Mallard is a case in point. Now, how and why should such a change have occurred except by sexual selection, or some process directly akin to it, pure and simple?

We think we can account for the way in which secondary sex characters are perpetuated, or perhaps even increased, on the assumption (in polygamous forms at least) that those males with the most marked sexual characters would tend to be the most vigorous in a struggle for the other sex. But this assumption leaves us completely in the dark as to the fundamental significance of sexual dimorphism, and further speculation is out of place in the present paper. We merely mention it to point out one of the biological problems which Mr. Thayer, in his enthusiasm, has ignored or glossed over with an artistic haze.

Another phase of the question which Mr. Thayer ignores is the question as to whether or not the habits of an animal demand protection. By skilful jugglings we are shown how anything and everything may be rendered inconspicuous, usually by artificial means, or under artificial conditions. The processes and steps by which these phases of coloration have been reached are ignored. The black and white skunk, the black and white zorilla of South Africa, and the curious, badger-like *Mydaus javanensis* of Java and Sumatra, have all independently taken on what we may call skunk coloration, and have all developed the well-known skunk smell. The line of demarcation between black and white as seen against the sky-line by a cringing grasshopper, or some other sort of puny prey, may in extremely rare cases aid the animal in getting food; but ordinarily speaking, the skunk would only be preyed on from animals which swooped upon it from above; and the fact that its insect prey surely has not eyes of the same image-forming powers as our own makes us believe, as other naturalists have, that this classic example of warning coloration is just as conspicuous as we have always supposed it to be.

Such creatures as Crows live by their wits, their wits are their protection; and skill in escaping an enemy is surely a character subject to evolution, and capable of considerable development. We know that a savage sees a green parrot in a green tree almost as easily as we see a hen strolling across a barnyard; and a hawk sees a mouse running in the grass, while circling high in the air, quite as easily. The hawk sees small birds in the same way; and we believe that the bird which can dodge most skilfully is the one that survives in the long run. Cases of the extermination of birds well protected by coloration are not rare. *Bowdleria rufescens*, from the Chatham Islands, has become completely extinct through the introduction of cats and possibly of weasels. Yet an examination of the two skins of this species preserved in the Museum here in Cambridge show us a bird rich brown above, streaked with darker brown, fading to white below — an ideal type of concealing coloration for a bird which lived in the reed beds or wild-flax fields of the desolate Chatham Islands. These birds disappeared because they could not use their wits, just as other birds disappear with the introduction of the mongoose. A hundred examples of such extermination could easily be cited. Yet birds colored in the same way live on in spite of the presence of many Herpestes in India, where they have always been indigenous.

Mr. Thayer, in a recent number of 'The Auk,' tells us that he has painted a Himalayan Mountain gorge from the colored feathers taken from the plumage of the male Monal,— why not female? He fails to add that he might have accomplished the same result with the colors seen in a polished agate, or taking the varied tints seen on the skin of a baboon's nose. This method of persuasion, while it does appeal to the public, is — there is no other word — simply charlatanry however unwitting. We are also informed that the colors taken from a flamingo, or rather the actual plumage of the bird, has been used to paint a splendid sunset. What would Mr. Thayer use to paint a rainy day,— may we perhaps suppose the colors of the bird's feet and bill? For rain does fall even where there are flamingoes.

The Papuasian forests of New Guinea and the Cape York Peninsula of Australia support a host of pigeons. These vary in form and hue from the great stupid Blue-gray Goura to the small lively doves of what we may conveniently term the genus *Ptilopus*. Among these arboreal pigeons we find some birds almost entirely pure white, and some solid green; others with the most bizarre arrangement of pink, and yellow, magenta, red, blue, and indeed almost every color. Are these birds of similar habits all equally protected in the same forest; or do they have so few natural enemies that they need less protection than usual?

If Mr. Thayer had handled a large museum collection of birds, and if he had happened to see any considerable number of them in their native haunts in more than one zoölogical region, he would probably realize, as other naturalists have realized, that amongst many groups of birds color appears to be absolutely haphazard, the result of selections of various sorts concerning which we have as yet but little understanding. The fact that a red tanager, for instance, is protected in a forest of green, because the colors are complementary and because red occurs in the small areas of light produced by sunshine coming through green foliage may be so, although we doubt it. Nevertheless we do know that a vast majority of the birds of that same forest are not colored red but some or indeed almost any other color!

Again we ourselves see in the origin of counter shading only a manifestation of the direct influence of light rays. The condition is not one which we can suppose to have been derived by selection of any sort. The white ventral surface of a flounder can be darkened by the action of light and pigmented fishes which have taken to living in caves have descendants which are pigmentless. Mr. Roosevelt has raised the question of why a counter-shaded creature covers its important white belly by squatting when it most needs any protection which counter shading might give. This question remains unanswered. So that suggestive as it is we cannot as yet quite swallow the theory of counter shading in its entirety.

We see in the vast variation of color which many closely related species exhibit, the operation perhaps of chance germinal variations, perpetuated because, on account of their relative unimportance, they cease to become an object of special selectional value to the individual. This is perhaps akin to variations seen in degenerated organs and tissues, which, no longer subject to selection, are apt to show marked individual variation.

The very wealth of variety of external coloration and pattern, as against the extraordinary stability of the more important organs and tissues, would tend in our eyes to lower its immediate protective importance.

Acquiescence in Mr. Thayer's views throws a pall over the entire subject of animal coloration. Investigation is discouraged; and we find jumbled together, a great mass of fascinating and extremely complicated data, all simply explained by one dogmatic assertion. For we are asked to believe that an animal is protectively clothed whether he is like his surroundings, or whether he is very unlike them (obliteratively marked); or, on the other hand, if he falls between these two classes, there is still plenty of space to receive him.

We cannot always presuppose so intense and bitter a struggle among all forms of life that an extremely slight favorable variation turns the balance, or that the constantly recurring momentary crises safely passed by the instant action of some color feature preserves one breeding individual in preference to another. The struggle exists, but is it quite so bitter as we would seem to have to believe? We are inclined to temper it with the spirit of altruism which Hanseman has so well discussed in his book, 'Heredity and Pathology.' Here the word altruism is used in a strictly biological sense as "the reciprocal relation between individuals and between species for the purpose of producing a more favorable modus vivendi for all"; and the idea is developed that annihilation cannot have been the underlying principle of evolution. Indeed, we think that nature is not always bitter. It is hard to find instances of a predatory animal surrounded by its normal environment causing the extinction of any species on which it lives. We do not believe this condition of affairs to be due to protective coloration, either.

We owe Mr. Thayer a debt of gratitude. He has brought a fascinating subject to a prominence that it has long deserved, but which it has not had. Much of what he shows us, where his illustrations are applicable to natural conditions, and where they are not specially arranged to illustrate some supposed state of affairs which may be capable at least of double interpretation, are of great value. We do not wish to seem destructive, and we have purposely omitted calling special attention to the strong features of the book. This has been done, and well done, by more able reviewers than ourselves. We have chanced to have, one or the other of us, opportunities for observation in the field in almost every part of the world; and for this reason, if for no other, we have felt emboldened to offer these critical notes; and we can but hope that Mr. Thayer and his followers will read them and interpret them in the spirit in which they are written. They are simply the impressions made upon open-minded observers who have no axe to grind, and who have no reason to take sides on the question, one way or another. They have been written in a friendly spirit, and we hope they will be received in the same way.

TEN YEARS OF OBSERVATION ON THE MIGRATION OF ANATIDÆ AT WENHAM LAKE, MASSACHUSETTS.

BY J. C. PHILLIPS.

WENHAM LAKE is 20 miles northeast of Boston in the town of Beverly and Wenham. It is one and one third miles in length, and is divided into an upper and a lower basin. The lower basin is larger and very much deeper, averaging across its middle portion over fifty feet, with several deeper spots. The upper basin is somewhat shallow with one very long cove, attractive to the surface feeders. The pond is situated in a thickly settled region. Along the eastern shore is a brightly lighted main road — Main Street. At the south end are two large pumping stations, with tall chimneys and numerous cottages. At the southeast corner and at the north end are ice-houses. The whole western shore is wild, mostly high land with white oak forest. In the fall the pumping operations often lower the level of the lake ten or twelve feet.

The pond weeds common to the lake, very kindly identified for me by Mr. W. L. McAtee of the U. S. Biological Survey, are quillwort (*Isoëtes echinospora*, var. *braunii*); pondweed (*Potamogeton lucens* and *P. perfoliatus*), the "red head grass" of Currituck Sound; *Naias flexilis*; *Sagittaria teres*; wild celery (*Vallisneria spirilis*). This sheet of water is therefore well supplied with foods attractive to ducks.

The following list of Anatidæ represents ten consecutive years of gunning and of careful records at a point on the western shore of the lake.

At present it is likely that future records of this sort will not be kept, so that it seems worth while, in view of the paucity of similar data, to give a complete list of all the species taken during this period, with brief notes about each; such estimates are of interest at least for purposes of future comparison.

I shall also give the percentage of each species as it figures in the totals for the ten years, and in the cases of the more uncommon varieties, the actual dates and numbers.

Before beginning, it may be well to sum up the actual result of each year in numbers, and also to give the yearly number of fowl seen from the stand, an actual record of which has been faithfully kept. In the table, "total fowl" means all fowl seen from the stand during the season in question. "Fowl flying" refers to those birds passing over which did not light, while "fowl in pond" are the birds which alighted.

Year	Total fowl	Fowl flying	Fowl in pond	Fowl shot	Records begun	Records ended	No. species taken
1900	984	581	403	163	Sept. 15	Nov. 20	13
1901	1149	619	520	327	" 20	Dec. 2	18
1902	591	291	300	182	" 15	" 9	19
1903	845	315	530	308	" 15	Nov. 26	19
1904	1476	860	616	345	" 5	" 10	20
1905	607	215	392	232	" 13	" 14	15
1906	248	54	194	51	Oct. 1	" 6	7
1907	292	78	215	104	Sept. 15	" 11	12
1908	368	89	279	177	" 20	" 11	16
1909	651	359	292	165	" 23	" 23	15
Totals	7211	3461	3741	2054			
Period 1900–1904:	5045	2666	2369	1325	364 (total days observation in first 5 years)		
Period 1905–1909:	2166	795	1372	729	269 (total days observation in second 5 years)		

The chief points to be noted in the above table is the extraordinary diminution of "total fowl" observed in comparing the last with the first five year period — 2166 as against 5045. It is true that we have 25 per cent less days of actual observation in the last period, but a glance will show that this paucity covers dates mostly outside the high tide of migration, the month of October and early November furnishing of course by far the most of the duck records, while by late November the migration of all save a few Black Ducks, Sheldrakes, Whistlers, Buffle-heads, and Green-winged Teal, is over. Geese do not figure very largely in these totals, as in a previous paper I have noted that the coastal flight is well to the eastward of Wenham Lake.

I do not believe for a moment that there is an actual diminution of fowl nearly as great as these figures suggest. The periods considered are much too short for actual comparisons of this sort. I know for instance that we have to consider the periods 1900–04, which an examination of the records of several clubs at Currituck, N. C., show to have been one of great abundance, for the surface feeding ducks at least. The season 1909–10 stands out above all others for one club which has kept a record since 1888–89. Fluctuations in numbers may last for one or several years.

Other factors, such as the increase of boating, and the placing of a great number of electric lights about Wenham Lake, have undoubtedly tended during the last five years to discourage fowl; but in spite of all this I cannot but feel that there has been an actual decrease of the migration wave for this locality, perhaps amounting to 20 or 25 per cent.

Some of the individual records given below are embodied in Townsend's 'Birds of Essex County.'

Mallard (*Anas platyrhynchos*). The total number taken for the entire period is 33. Not many more are noted. The Mallard occurs in little scattered flights which extend over two or three days, during which nearly all the gunning points get one or two. They have never occurred in September, and usually not before October 12 or 15. During the years 1900, 1905, 1906, 1907 and 1908 none were noted at all.

Black Duck (*Anas rubripes* Brewster). Occurs occasionally in considerable numbers during the latter part of September, but for the last five years there have been very few noted. On years when Black Ducks are numerous there is always a good showing in September. If a September flight occurs, it is sure to arrive any time after September 18 with the first cool frosty night, especially if preceded by a northwest wind.

This September flight we have always found preceded and accompanied by a marked migration of Osprey (*Pandion haliaëtus carolinensis*). These early birds are tame and easily decoyed. Mr. Brewster in 'The Auk' for July, 1909, noted that my records showed typical red-legged individuals occurring early only three times: September 29, 1904, October 3, 1907, and October 9, 1906. After October 20 they are common.

None of the regular local Black Ducks have ever used Wenham Lake, though undoubtedly if there was no boating, birds from Essex and Ipswich would use this sheet of water for a drinking and resting spot. Occasionally late in the fall and sometimes on heavy northeast storms, accompanied by high tides, a flock or two of "bay ducks" will come over from the salt water. These local ducks are extremely wary, and if shot, smell strongly of their salt-marsh foods.

The largest flock of Black Ducks which has visited the lake in the last ten years is 25. Flocks of over ten or twelve are rare. They arrive usually from a northeast or southeast direction, and alight far from shore in broad water.

Black Ducks represent over 33 per cent of the entire results for the ten year period. This is the duck *par excellence* of a thickly settled and shot-out country, for if given any chance at all, it will hold its own. The introduction of motor boats and night herring torching on the numerous creeks of the Ipswich marshes has sadly cut down the winter residents in Essex County. The main local breeding ground is the valley of the Ipswich River and its tributary brooks, where the building of cottages and the increase in canoes ever tends towards forcing the birds into a more restricted area. Careful spring protection, however, holds out hope that they may hold their own. In early August, 1908, while on a house-boat in Plum Isle River I had the opportunity to see 150 Black Ducks coming each evening to an artificial fresh water pond of some 75 acres in extent. This, however, was an unusual sight, even for this, a favorable spot.

GADWALL (*Chaulelasmus streperus*). This duck, exceedingly rare in eastern Massachusetts, has occurred only once, October 26, 1904, when a single female was secured. Dr. Townsend, in 'The Birds of Essex County,' mentions several more taken during the same season.

BALDPATE (*Mareca americana*). The Widgeon is not at all an uncommon bird. There are numerous dates for September in the Wenham Lake records. They are often seen as single birds or in pairs, and once or twice in little flocks. Nineteen is the largest number in one year for the stand, and they have occurred every season except one. Fifty-six individuals have been taken. These Widgeon have usually decoyed readily, and seem to delight in climbing up on the beach, where they run about on good terms with the live decoys. They are, of course, all in immature plumage.

WIDGEON (*Mareca penelope*). While looking at the axillary feathers of various birds in the Museum of Comparative Zoölogy, Mr. Outram Bangs recently pointed out to me a new way of distinguishing at a glance, regardless of sex or plumage, between *M. americana* and *M. penelope*. This has enabled me to identify four Widgeon skins as belonging to *M. penelope* out of six skins from Wenham Lake, as follows: An immature male and a female taken Nov. 15, 1904, and two females (from the collection of Dr. C. W. Townsend) dated Oct. 17, 1903. All four of these skins have reddish heads. The 1903 birds are remembered to have been saved on account of their appearance, but the other two were probably set aside at random.

The characters referred to above are as follows: *M. americana*, axillaries practically pure white, except for a very fine dusky pattern at extreme tips or a slight dusky line along the main shaft in some cases. *M. penelope*, axillaries markedly dusky and finely patterned, especially on the inner webs. The outer webs may be almost entirely white, giving an appearance of white axillaries, until the feathers are spread apart.

This distinction has thus far been found to hold good through the entire series of Widgeon skins in the collection of Mr. William Brewster and the Museum of Comparative Zoölogy, comprising about fifty specimens of *M. americana* and about twenty-five of *M. penelope*.

The findings suggest the fact that *M. penelope* is far from an uncommon bird and may turn out to be relatively more common among birds of the coastal migration route. Owing to the imperfect plumage of early fall Widgeon, it is not surprising that *M. penelope* has been overlooked, especially in Massachusetts.

GREEN-WINGED TEAL (*Nettion carolinense*). Has only occurred four times in the ten years, nine individuals being taken. The dates were in late November and December.

BLUE-WINGED TEAL (*Querquedula discors*). This duck is represented by only 13 individuals, this paucity being due to the fact that its migration is commonly in the second week in September, lasting but three or four days, and following rather strictly along the coast. During the great teal flight of 1904 I saw a flock of about 50 on Wenham Lake on the evening of September 13, as noted in Townsend's 'Birds of Essex County'; and on the same day another flock passing. September 15, 16, 22, and 27, 1904, flocks of teal were noted; but these are the only flocks appearing in the records.

The Blue-wing, quite curiously, is often associated singly with one or two Black Ducks. They quack lustily on hearing the decoys, and seem anxious to come to shore.

SHOVELER (*Spatula clypeata*). Represented by two specimens only, October 8, 1901, and November 6, 1903.

PINTAIL DUCK (*Dafila acuta*). This duck, which, with several other species goes in Massachusetts by the name of Gray Duck, is always seen in very poor plumage, and is confused with Widgeon, Gadwall, and Mallards. Our records show but 22 individuals and a few others observed. The flight is early. There are no November records for Wenham, but at Oldham, south of Boston in the town of Pembroke, Mass., I have one for November 21, 1909.

WOOD DUCK (*Aix sponsa*). Scarce migrant, but not uncommon locally. There are a few about the lake from early April to late October. These are birds which breed near by. They pay no attention whatever to the decoys. They often frequent a small mud-hole near the eastern shore of the lake. The largest flock of apparent migrants was eight, on October 3, 1903.

REDHEAD (*Marila americana*). The Redhead usually puts in a sudden appearance, often mixed with Lesser Scaup Ducks, occasionally single, but mostly in small flocks. They break out of the sky with a roar of wings. On the pond they are, in the presence of live decoys at least, very restless, continually making short unexpected flights, only to return to the same spot. During the best year, 29 were secured, and another year 22. They have occurred eight out of the ten years, and 82 specimens have been taken. They are of course rare here as compared with ponds on the south shore of Martha's Vineyard.

CANVAS-BACK (*Marila vallisineria*). This species has occurred as follows: one on November 13, 1902; 5 on November 4, 1905, and two on November 3, 1909. One other individual was identified through a glass, but this completes the list. It was a curious coincidence that on the morning of November 4, 1905, three Canvasbacks came to the decoys before it was light, and at 2:30 P. M. of the same day a pair was taken.

SCAUP (*Marila marila* and *M. affinis*). These two species have been bunched in the records, so that it is not possible to separate them. During the last three seasons, however, and in 1904, count has been kept, and places the Greater Scaup at about 20 per cent of the number for the two combined species. The Scaups represent 13 per cent of the entire bag for the ten years. The Lesser appears at times in flocks of 12 to 25, while the large Scaup are often single, or three or four together. Nearly every flock of Redheads has had at least one or two Scaup among them. Scaup appear scattered along in the records late into November, and my earliest for the lake is September 18, 1904 (*M. marila*). The next earliest is October 4, 1900 (species not stated). Their appearance between the 8th and 12th of October is regular enough to be depended upon, and only once are they recorded as late as October 18.

RING-NECKED DUCK (*Marila collaris*). It is possible that some of these may have passed as common Scaups, as I did not see all the birds as they were taken. I am sure, however, that only a few could have got by in this way. The records show three specimens: one each on October 9 and 26, 1907, and one on October 13, 1908.

GOLDEN-EYE (*Clangula clangula americana*). A very common bird in the pond late in November, and always tending to become local at that time of the year, moving back and forth to the saltwater with the regularity of clock-work, but never, so far as I am aware, spending the night on fresh water. Some fifteen years ago I shot several Whistlers about September 26 or 28,— the date was lost; but for the ten years the earliest appearance is October 8, 1904. The number taken, 5 per cent of the total fowl, does not at all represent the true abundance of this bird, as its natural shyness and absolute disdain for live decoys make it one of the most difficult birds to take from the shore. In the spring it is the first fowl to cheer the desolate surface of the lake, gathering in little flocks before the ice is out, and tracking regularly to salt water for several weeks.

BUFFLE-HEAD (*Charitonetta albeola*). A common late arrival at the pond in small flocks of three to six, and often with Ruddy Ducks. The earliest arrival is October 9, 1900; the latest arrival, November 4, 1904. From the 19th to the 25th of October is the ordinary date of appearance. Forty-seven individuals have been taken, which number does not represent their relative abundance, as they were not always shot on account of their small size and inferior flesh.

OLD-SQUAW (*Harelda hyemalis*). A rare duck in the ponds of Massachusetts, and represented here by only four individuals. Several others are noted as being seen. Occurred alone each time. The earliest is October 20, 1902.

NORTHERN EIDER (*Somateria mollissima borealis*). Has never occurred to my knowledge in the ponds of eastern Massachusetts except once at Furnace Pond, Pembroke, November 9, 1909. Three were shot, one of which is in my collection.

SCOTERS (*Oidemia americana, O. perspicillata*, and *O. deglandi*). Of these three ducks, the White-winged Scoter is by far the most common in the pond, and represents about 4 per cent of the total score. Large flocks of Scoters in migration are rarely seen at Wenham. Such a flight was only once noted, October 9, 1900, in a heavy northeast storm. Our point of observation is too far west to see many of these fowl.

RUDDY DUCK (*Erismatura jamaicensis*). The Ruddy Duck represents 15 per cent of the total number of fowl taken. From year to year there is a great variation in the number of these birds seen. In 1905, 114 were taken, and 70 others recorded, while in 1907 only one was taken, and two others noted. The earliest date is September 30, 1904.

CANADA GOOSE (*Branta canadensis*). As I have noted in a previous paper (Auk, July, 1910), geese are much less common here than at Chebacco Lake on Cape Ann, or rather at the base of it. There is a fly-way across the north end of Wenham Lake between Dodge's and Burnham's Hills, where far more geese pass than at the blind, from which point this fly-way cannot be seen. One hundred and eighteen geese figure in the totals. On a number of years, as will be seen by the table, the camp was closed too early to take advantage of the geese.

CORMORANT (*Phalacrocorax carbo*). Occasionally these birds have dropped into the lake, when, after a few dives, they usually go out of their own accord. Seven specimens have been taken, and a few others noted on the pond. Flocks in migration are common.

AMERICAN MERGANSER (*Mergus americanus*). A moderately common visitor to the lake after November 1. Twenty-three specimens have been taken, but among these only two fine males. On December 7, 1902, I have a record of the weights of these two males; 3 lbs. 15 oz. and 3 lbs. 7 oz. It is probable that the migration of the males is much later than that of the females.

RED-BREASTED MERGANSER (*Mergus serrator*). About as common as the American Merganser, 29 having been taken. Adult males very rarely seen, as in the foregoing species. Neither of these birds take kindly to live decoys, and approach the shore only in rather deep water.

HOODED MERGANSER (*Lophodytes cucullatus*). This bird has occurred in nine of the ten years, and is by far the commonest merganser seen about the pond. Adult males are again exceedingly rare. Out of 44 birds taken, I have only one really fine male in my collection, while I can recall only one or two others nearly approaching adult plumage. The fine male was taken on November 2, 1908. Unlike the preceding two species, this "wood sheldrake" is glad to associate with live decoys, and usually swims quickly among them if he alights near by. Of late years we have allowed them to go unmolested.

HOLBŒLL'S GREBE (*Colymbus holbœlli*). Represented by three specimens only, taken Oct. 27, 1903, Oct. 24, 1904, and Nov. 13, 1902.

HORNED GREBE (*Colymbus auritus* Linn.). Not very common. On October 1, 1904, a flock of 26 came into the lake, and six specimens were taken. A few others have been seen, but they have not always been separated from the Pied-billed Grebe in the records.

PIED-BILLED GREBE (*Podilymbus podiceps*). Seen quite commonly about the pond any time after the first of September. Has an innate love for the live decoys, among which it dives, striking terror into their hearts. By the end of October the grebes are rare.

LOON (*Gavia imber*). Very common in migration, but rather rare in the pond. If the gunner watches his decoys closely, he will often catch them cocking their heads, and if he looks directly into the zenith he may often see very high-flying fowl, more than likely loons. Large numbers of fowl which are so high as not to be visible except when directly overhead must escape observation. Only three loons are noted as having been shot, but many others were left unmolested. They evince a good deal of curiosity about the live decoys, and like to swim about just out of gun range.

RED-THROATED LOON (*Gavia stellata*). Rare in the pond. The only specimen in my collection is a female marked Wenham Lake, October, 1906. This bird has probably been once or twice included in the records under loons.

COOT (*Fulica americana*). Very common, but usually appearing alone. By nature rather sociable, this bird likes to come in amongst the decoys, or to sit on the beach near by. It is not uncommon at the time the camp is opened, and the latest date is Nov. 19, 1904.

Chebacco Lake.

This pond is situated four miles east and a little north of Wenham Lake. It is a long, narrow, and rather shallow pond of irregular shape, one and one fourth miles in length. It is therefore nearer the sea, and at the base of Cape Ann.

In looking over the gunning notes for a stand on the east shore of this pond from the year 1894 to 1909, there are several interesting facts worth noting.

The chief difference between this lake and Wenham is the comparative rarity of deep-water ducks — Redheads, Scaups, Ruddy

Ducks, and Whistlers; while a great many more Black Ducks and geese are seen in migration.

For instance, during the ten year period which we are considering at Wenham, I find Ruddy Ducks mentioned only on three years: one was taken in 1906; 2 in 1908, and five in 1909.

Redheads: 2 in 1904, 9 in 1909.

Whistlers are seldom seen or taken.

The proportion of Black Ducks to the total bag is larger than at Wenham. Spoonbills are noted on four occasions, five birds having been taken.

The terms Widgeon and Gray Ducks are used a great deal, but as these names are applied to a variety of species, it is not safe to lay too much stress upon them.

Geese are seen in some numbers at Chebacco Lake, perhaps three times as many as at Wenham.

Brant have come to the pond on two occasions, November 9, 1905, and November 26, 1900. They have been noted in flight several times.

In order to try and get a clear idea regarding the part of the country whence the Wenham flight ducks have come, a collection of stomachs was made in 1909, representing 11 species by 66 specimens.

These were very kindly analyzed by Mr. McAtee and his report is freely quoted below. Referring to the entire collection Mr. McAttee says: "One remarkable fact about them is that of the entire lot of 66, 22 were empty or nearly so. This is an unusual proportion of empty stomachs.... However, many of the birds must have had access to good feeding, as shown by the presence of wild celery, *Vallisneria spiralis*, in 12, and several of the stomachs were well filled.... The percentage of mineral matter for the whole number of stomachs is 35.6, rather high, showing that on the average the birds were not full fed. Most of them had access to good fresh-water feeding grounds, the Black Duck, Widgeon, Mallard, Ruddy, Goldeneye, and Canvasback getting buds and rootstocks of wild celery....Most individuals of the above mentioned species, and of both Scaups and Blue-winged Teal and Merganser had secured their food in fresh water. The Geese, however, one containing eel-grass and 8 an alga like the sea lettuce, *Ulva*, came from the coast. The presence of marine mollusks in the stomachs of two Black Ducks, 2 Lesser Scaup and one Greater Scaup shows where these birds had been feeding before visiting Wenham Lake."

Mr. McAtee adds that he could make nothing out as to the point of origin of these birds from their stomach contents, but thinks that it is evident that they have come from a considerable distance without stopping long to feed. The analyses in detail are as follows:

"The contents of the Black Ducks' stomachs (29 in all, 4 empty) was 88.4 per cent. vegetable, the principal items being seeds of bur-reed (*Spanganium*), pondweed (*Potamogeton*), bulrush (*Scirpus*), eel-grass (*Zostera*) and mermaid weed (*Proserpinaca*), and buds, rootstocks, etc., of wild celery. The animal matter, amounting to 11.6 percent., included, in the order of importance, snails, ants, chironomid larvæ, bivalves, crustacea, and insects. The percentage of mineral matter of the gross contents was 36.5.

"The Geese had eaten vegetation entirely, including grass, eel grass, and algæ. Six of the 9 gizzards were nearly empty, and the mineral matter was 68.33 per cent of the gross contents.

"The Widgeons were entirely vegetarian also, consuming pond weed, wild celery, water-lily seeds (*Brasenia*), bur-reed, and smartweed seeds (*Polygonum hydropiper*). Mineral matter, 65 per cent.

"Three of the 5 Greater Scaup stomachs were empty; the others held animal and vegetable matter in equal proportions, the items being bur-reed, pondweed, and bivalves (*Gemma gemma*). Three of the four Lesser Scaups were almost without food, the objects secured being seeds of bur reed, bayberry, and saw-grass (*Cladium effusum*), and snails (*Lunatia heros*), and ants.

"The three Mallards had full stomachs. Ninety-seven per cent of the food was vegetable, including seeds of bayberry, saw-grass bulrush, mermaid weed, and pondweed, seeds and plants of *Naias flexilis*, and buds, roots, etc., of wild celery. Their animal food included a dragonfly nymph, chironomid and caddis larvæ, crustacea, and snails.

"Six of the 10 Ruddy Duck stomachs were empty or nearly so. The food was 40 per cent vegetable and 60 per cent animal; gravel, etc., 50 per cent. Seeds of bur-reed, pondweed, bulrush, and *Naias* and buds, etc., of wild celery are the plant items, and chironomid and hydrophilid larvæ the animal substances.

"Four other species of ducks are represented by single stomachs. The Goldeneye contained seeds of pondweed, water-lily, bayberry, and bur-reed, buds and roots of wild cleery, and bits of water boatmen, and dragonfly nymphs. Animal matter 6 per cent; vegetable, 94; mineral 40 of the gross contents.

"The Canvasback had eaten seeds of bur-reed and wild celery buds. Vegetable matter, 100 per cent; mineral 60. The Hooded Merganser contained dragonfly nymphs and caddis larvæ. Animal matter, 100 per cent; mineral 20. The Blue-winged Teal had many young snails, various insects, and seeds of bur-reed, pondweed, smartweed, and various sedges and grasses. Animal matter, 88 per cent; vegetable, 12 per cent; mineral, 8 per cent."

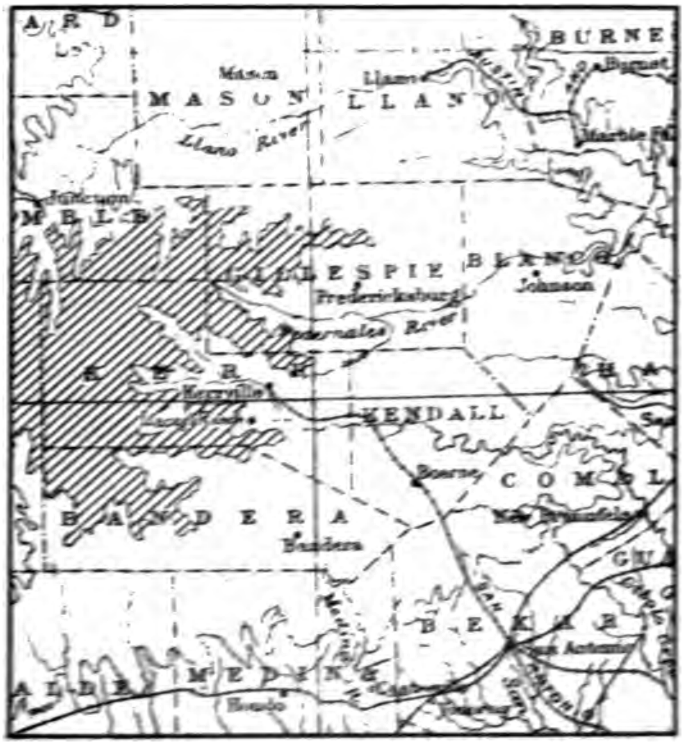
THE BIRDS OF KERRVILLE, TEXAS, AND VICINITY.

BY HOWARD LACEY.

THE following list contains the observations I have made at my ranch where I have lived since 1882. Being always in the woods and fields, I have had a good chance to get acquainted with the natural history of the county. The ranch is seven miles southwest of Kerrville, in Kerr County, and about fifty-five miles northwest of San Antonio. It consists for the most part of rough hills and still rougher hollows and cañons, lying at an elevation of about 1800 feet, between the Guadaloupe River and its tributary Turtle Creek. It is well watered by small springs, but there is no considerable body of water nearer than the river.

The timber near Kerrville is mostly pecan, live-oak, hackberry and walnut in the valleys, with some fine cypress along the main river; on the hills occur cedar (*Juniperus*), shin-oak and Spanish oak. In the eastern and northwestern parts of the county there is a good deal of mesquite and the same sort of chaparral as occurs near San Antonio and several forms of animal life are common there that we seldom or never see near Kerrville.

Kerr County is especially interesting zoölogically because it marks the most southeastern extension in Texas of the Upper Austral Life Zone, which occurs here as a narrow peninsula extending into the county from the northwest and surrounded on three sides by the Lower Austral Life Zone to which belongs the larger part of the plants and animals of the county.



Map of Kerr County, Texas. Shaded portion indicates Upper Austral Life Zone; unshaded portion = Lower Austral Life Zone.

Among the characteristic birds of the Lower Austral Zone that are here close to their northern or northwestern limit may be mentioned: *Anhinga anhinga, Mycteria americana, Florida cærulea, Ionornis martinicus, Scardafella inca, Catharista urubu, Parabuteo unicinctus harrisi, Buteo abbreviatus, Polyborus cheriway, Centurus aurifrons, Pyrocephalus rubinus mexicanus, Passerina ciris, Bæolophus atricristatus sennetti, Auriparus flaviceps.*

The intrusion of the Upper Sonoran Life Zone results in two interesting developments of the bird life. The first is the remaining here through the summer of several Upper Sonoran species, which here find the extreme southwestern limit of their breeding range: *Sayornis phœbe, Passerina cyanea, Lanivireo flavifrons, Mniotilta varia, Dendroica dominica albilora, Oporornis formosus.* The second result is the occurrence of several western species that rarely if ever extend further eastward: *Callipepla squamata, Cyrtonyx montezumæ mearnsi, Otus asio aikeni, Bubo virginianus pallescens, Coccyzus americanus occidentalis, Melanerpes formicivorus, Tyrannus verticalis, Aphelocoma texana, Corvus cryptoleucus, Icterus bullocki, Amphispiza bilineata, Aimophila ruficeps eremœca, Pipilo fuscus mesoleucus, Passerina amœna, Salpinctes obsoletus, Catherpes mexicanus conspersus.*

The list contains the usual percentage of accidental visitants: *Phalacrocorax vigua mexicanus, Dendrocygna autumnalis, Sphyrapicus thyroideus, Tyrannus melancholicus couchi, Zamelodia melanocephala, Hesperiphona vespertina,* the last of which is a new bird for the State.

List of Species.

1. **Podilymbus podiceps.** PIED-BILLED GREBE.— Occasional in winter on the Guadaloupe River. One was brought to me on August 29, 1910.

2. **Larus franklini.** FRANKLIN'S GULL.— On April 26, 1909, a severe hail storm passed down Turtle Creek (a tributary of the Guadaloupe) at about 9 P. M. and did much damage, killing some livestock and many small animals and birds. Several Franklin Gulls were picked up dead and one was caught alive by a friend. I had not seen the bird here before, but saw a small flock on May 17, 1910.

3. **Hydrochelidon nigra surinamensis.** BLACK TERN.— A Tern seen nearly every year in late summer and early fall along the Guadaloupe belongs probably to this species; I have never been able to procure a specimen. Saw one August 23, 1910.

4. **Anhinga anhinga.** WATER-TURKEY.— Not at all common. Sometimes breeds on the Guadaloupe and its tributaries.

5. **Phalacrocorax vigua mexicanus.** MEXICAN CORMORANT.— One shot on the south fork of the Llano River, July 30, 1899.

6. **Mergus americanus.** MERGANSER.— Occasional in winter on the Guadaloupe River.

7. **Mergus serrator.** RED-BREASTED MERGANSER.— Occasional in winter on the Guadaloupe. In 1903 I saw a flock of about a dozen on the river just above Kerrville, as late as the first of May.

8. **Lophodytes cucullatus.** HOODED MERGANSER.— Occasional in winter.

9. **Anas platyrhynchos.** MALLARD.— Fairly common in winter. On October 31, 1883, there were thousands of these birds on the divide between Turtle Creek and the Guadaloupe; it was a dull misty day and they were feeding on the post oak and blackjack acorns of which we had a heavy crop that year. I have several times since seen them with their crops full of acorns.

10. **Chaulelasmus streperus.** GADWALL.— Fairly common in winter for a duck in a rather dry country. On May 17, 1905, a mixed flock of Gadwalls and Widgeons settled on a small pond in a field near the ranch house. We killed five or six of them and among them a female Gadwall that had plucked all the *outer* half of the down from her breast. She contained no eggs but had evidently nested somewhere that spring. This circumstance shows that some species of ducks would nest here if they had adequate protection.

11. **Mareca americana.** BALDPATE.— Not uncommon in winter. Seen here as late as May 19.

12. **Nettion carolinense.** GREEN-WINGED TEAL.— Occasional in winter.

13. **Querquedula discors.** BLUE-WINGED TEAL.— Common in winter; the earliest of the ducks to come back to us in August. Has been known to breed near San Antonio and would breed here if protected.

14. **Spatula clypeata.** SHOVELLER.— Occasional in winter.

15. **Dafila acuta.** PINTAIL.— Occasional in winter.

16. **Aix sponsa.** WOOD DUCK.— Formerly quite common, now very scarce; nested on the head of Kelly Creek on 1883–84; have not seen one for some years.

17. **Marila affinis.** LESSER SCAUP DUCK.— Not uncommon in winter.

18. **Erismatura jamaicensis.** RUDDY DUCK.— Have seen one that was shot on the Guadaloupe River.

19. **Anser albifrons gambeli.** WHITE-FRONTED GOOSE.— A bird killed and described by a friend probably belonged to this species. Geese very seldom settle anywhere in this county, but pass on to the coast prairies in the autumn, and towards the north in the spring.

20. **Branta canadensis.** CANADA GOOSE.— Most of the geese that

pass in spring and autumn belong probably to some form of this species. Earliest spring records, March 1; latest, April 11. Earliest autumn record, September 27.

21. **Dendrocygna autumnalis.** BLACK-BELLIED TREE-DUCK.— Saw a *Dendrocygna*, probably this species, when fishing on Turtle Creek on June 24, 1906. I was several times within easy gunshot of the bird. This is two hundred miles north of the normal range of the species.

22. **Mycteria americana.** WOOD IBIS.— Not common; saw five of these birds at the ranch on September 23, 1900; a flock of fifty or more frequented Turtle Creek from late in July, 1902, until the middle of August.

23. **Botaurus lentiginosus.** BITTERN.— The rather rapid mountain streams of this county are not well adapted to the needs of the bittern, but one is occasionally noted. One was shot in the little irrigation ditch at the ranch on October 28, 1908.

24. **Ardea herodias** subsp.? GREAT BLUE HERON.— Not uncommon; a few pairs breed in the county, usually by themselves. Early in April, 1893, about ten pairs were nesting together in the cedar trees (*Juniperus*) that overhang the steep cliffs of a ridge called the "Devil's Backbone" on Johnson Fork of the Guadaloupe. All the nests that I examined contained four eggs, and the birds remained on the nests until we were close to them. I have not heard of the birds nesting there since that date.

25. **Florida cærulea.** LITTLE BLUE HERON.— In 1882 and 1883 three or four pairs nested in a tall cypress tree at the mouth of Kelly Creek on the Guadaloupe. A flood or a high wind knocked down the tree and I know of no other nesting place. The birds are frequently seen in July and August along the Guadeloupe and its larger creeks, most of them in the white plumage. On July 12, 1901, on the Guadaloupe, I saw one little blue heron and three little white ones, and with them was a white heron about one third larger than the others.

26. **Butorides virescens.** GREEN HERON.— Rather common for a heron and breeds here regularly. Earliest spring record March 31, 1896; average for fifteen years about April 19. Nest with four fresh eggs May 6, 1897.

27. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON.— Have seen a night heron on two or three occasions, probably this species, but many years ago; and I can find no record of it except that I have it on my list.

28. **Grus mexicana.** SANDHILL CRANE.— Passes over commonly in spring and autumn but very rarely settles in this rough hilly country. One was shot on Turtle Creek some years ago, but was probably a weak or crippled bird. Earliest spring record for 15 years, March 1; average, April 1. Earliest autumn record, September 16; latest December 25; average, October 10.

29. **Rallus virginianus.** VIRGINIA RAIL.— When fishing with Mr. H. P. Attwater on Turtle Creek September 14, 1896, we watched a rail feeding on the other side of the creek which was about 40 feet wide in that

place; we both came to the conclusion that the bird belonged to this species.

30. **Porzana carolina.** SORA.— On the night of September 20, 1896, a bird struck the tin roof of the ranch house and rolled off on to the ground; we went out with a lantern and picked up a Sora Rail: it possibly mistook the roof for a pond.

31. **Ionornis martinicus.** PURPLE GALLINULE.— May 20, 1909, a boy brought to Kerrville two Coots and a Purple Gallinule that he had shot on the Guadaloupe.

32. **Gallinula galeata.** FLORIDA GALLINULE.— Many years ago I had several of these birds that had been shot on the Guadaloupe and I have occasionally heard of them since.

33. **Fulica americana.** COOT.— Not uncommon in spring and autumn; would breed in suitable places if allowed to do so.

34. **Recurvirostra americana.** AVOCET.— Occasional: seen on September 3, 1902, and July 22, 1906.

35. **Himantopus mexicanus.** BLACK-NECKED STILT.— Occasional: seen on August 31, 1889.

36. **Gallinago delicata.** WILSON'S SNIPE.— Not uncommon in winter; it seeks the small warm springs in hard weather. Earliest record, September 13; average about October 10; have seen it as late as March 13.

37. **Pelidna alpina sakhalina.** RED-BACKED SANDPIPER.— A friend gave me two of these birds that he had shot out of a small flock along the Guadaloupe on August 8, 1897.

38. **Totanus melanoleucus.** GREATER YELLOW-LEGS.— Occasional, in company with *T. flavipes.*

39. **Totanus flavipes.** YELLOW-LEGS.— Not uncommon on migration; latest spring date May 15; earliest date of return, July 17.

40. **Helodromas solitarius** subsp. SOLITARY SANDPIPER. — Quite common in migration, April 12 to May 15; have seen it returning July 15.

41. **Actitis macularia.** SPOTTED SANDPIPER.— Quite common in migration and probably breeds as it has been noted in June on several occasions.

42. **Numenius americanus.** LONG-BILLED CURLEW.— Frequently seen or heard passing overhead in August and September.

43. **Charadrius dominicus.** GOLDEN PLOVER.— Some time in the autumn of 1882 I flushed a flock of plover on a fairly open place on the divide, which I feel sure belonged to this species. I was just out from England where I was well acquainted with the European form: have not seen a single specimen since.

44. **Oxyechus vociferus.** KILLDEER.— Common all the year; nests about the middle of March. On March 24, 1896, I was driving a flock of goats to their pen and noticed that at a certain point they divided into two flocks; I walked up to the place expecting to find a rattlesnake, and found instead a killdeer standing over her eggs with outspread wings and scolding vigorously.

45. **Colinus virginianus texanus.** TEXAS BOB-WHITE.— Common resident, getting scarcer for the last few years although comparatively few get shot at any distance from the small towns. Armadillos and hogs break up a good many nests. I have (on three occasions only) heard the male bird (when nesting) give a curious little chirping crow on being flushed. After the breeding season is over the well-known call "Bob-white" is not heard until the middle of the next April when they begin to pair again; I have listened for the call for many years and never heard it before April 16; the average date is about April 20. They usually try to raise two broods here and I have found newly hatched young in October. I once saw a hen quail fighting a Road-runner and she finally succeeded in driving it away from her baby brood.

46. **Callipepla squamata.** SCALED QUAIL.— Have seen this bird on the head of Johnson Fork of the Llano River in the northwest corner of this county; it occasionally breeds there but is rare and the locality is nearly at the southeastern limit of the range of the typical form of the species.

47. **Cyrtonyx montezumæ mearnsi.** MEARNS'S QUAIL.— Formerly fairly common in the western part of the county; have seen it at the ranch, 7 miles southwest of Kerrville, and on one occasion at least it has nested there. It is getting to be quite rare.

48. **Tympanuchus americanus.** PRAIRIE CHICKEN.— The oldest inhabitant had never seen a Prairie Chicken in this county until late in November, 1885, when one or two were reported as having been seen west of Kerrville. By the middle of December of that year they were very common at the ranch and on the dry headers of the Guadaloupe and Llano rivers, and were a welcome addition to the ranch fare from that time until early in April, 1886, when they all left us and have not been seen here since. It is too late now to determine the species and they may have been the Lesser Prairie Chicken (*Tympanuchus pallidicinctus*).

49. **Meleagris gallapavo intermedia.** RIO GRANDE TURKEY.— Formerly very common, but getting rather scarce now that the shot gun is becoming almost as common a piece of furniture as the rifle in the ranchman's house. These birds are as foolishly tame when about half grown as they are wild and able to take care of themselves when fully mature: if they were not shot at until fully grown and allowed to roost in peace at night, there is no reason why we should not have them always with us. Armadillos and skunks sometimes roll the eggs out of the nests, and they have plenty of enemies besides the boy with the shotgun. The hen turkey as a rule begins to lay in March and I have seen quite small young ones early in April. If their first nest is broken up they will try again and I have found a nest with seven fresh eggs in it as late as June 4.

50. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Very common in summer, and some few remain all the winter. After a day or two of really cold weather they get very weak and many of them die. They come to the fodder stacks in hard weather with the snowbirds and

sparrows and while the little birds are quite brisk and cheerful, the doves are hardly able to get out of one's way.

51. **Melopelia asiatica.** WHITE-WINGED DOVE.— One of these birds was killed in a field near Kerrville by a friend of mine on November 25, 1910. This is the most northwestern record for the State. I have heard that it has also been killed on one or two occasions at Boerne in Kendall County.

52. **Scardafella inca.** INCA DOVE.— Rather common in San Antonio and Kerrville and I have twice seen it at the ranch. It is a bird of the town rather than the open country and is about as confiding as the sparrows. It here reaches its extreme northeastern range in the State.

53. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Very common; the majority leave in winter but a few remain all the year. Nests in caves like the Black Vulture, but as a rule nearly a month later than that bird.

54. **Catharista urubu.** BLACK VULTURE.— Very common resident; nests in caves, which are numerous in this limestone country. Eggs are laid as a rule during the first week in March. The young feign death when disturbed and I have seen an old one with the tip of its wing broken do the same thing.

55. **Ictinia mississippiensis.** MISSISSIPPI KITE.— Have not seen it in this county, but had one of a pair shot about 100 miles northwest of here in May, 1904, near the extreme western limit of the species.

56. **Circus hudsonius.** MARSH HAWK.— Fairly common in winter, in the more open parts of the country; usually arrives early in September. Have not heard of it as breeding anywhere in this county.

57. **Accipiter velox.** SHARP-SHINNED HAWK.— Fairly common in winter. Does not breed here.

58. **Accipiter cooperi.** COOPER'S HAWK.— Common all the year. Nests early in April.

59. **Parabuteo unicinctus harrisi.** HARRIS'S HAWK.— Occasional. Have sometimes seen it in autumn and spring.

60. **Buteo borealis.** RED-TAILED HAWK.— The bird is (for a large hawk) a common resident. Nests in March on a bluff or in a tree. This bird is rather frequently seen with a good deal of white about it. One almost pure white stayed near the ranch for several years. I shot one that had much white on the wings and back; and a pure white bird, with black eyes was kept for years as a pet in a saloon at Kerrville in the early eighties.

61. **Buteo lineatus** subsp.? RED-SHOULDERED HAWK.— Not rare, but formerly much more common than it is now. Breeds in tall timber along the river and creeks.

62. **Buteo abbreviatus.** ZONE-TAILED HAWK.— A not unfrequent visitor in August and September. I see or hear of one or two almost every year. This is near the extreme northern limit of the species.

63. **Buteo swainsoni.** SWAINSON'S HAWK.— Large flocks pass over here in spring and autumn and are locally called Grasshopper Hawks.

Formerly they were in larger flocks than we see now. In the spring they come from April 3 to 27; in autumn from September 15 to October 12.

64. **Falco columbarius.** PIGEON HAWK.— Fairly common in winter and are rather given to stealing chickens.

65. **Falco sparverius.** SPARROW HAWK.— Very common in winter, generally arriving in August. I have no record of this bird breeding in the county but obtained a female on July 3, 1905, that had evidently been recently brooding on eggs. Saw one on July 5, 1908.

66. **Polyborus cheriway.** AUDUBON'S CARACARA.— A rather rare visitor along the Guadaloupe valley.

67. **Pandion haliaëtus carolinensis.** OSPREY.— One or two of these birds are seen every summer along the Guadaloupe, but I have no record of a nest. Have seen them as early as April 24 and as late as November 3.

68. **Aluco pratincola.** BARN OWL.— Not common. A pair bred many years ago in an old rock building at Kerrville, and I have seen the species once or twice along some of the bluffs.

69. **Asio wilsonianus.** LONG-EARED OWL.— I shot one of a pair of these birds on April 4, 1898; this is the only record I have.

70. **Strix varia** subsp.? BARRED OWL.— Oftener heard than seen; probably fairly common for an owl and resident.

71. **Otus asio aikeni.** AIKEN'S SCREECH OWL.— Very common. Nests as a rule early in April, and on warm days may be heard at midday in February and March. A pair of these birds tried to breed in a small heating stove in the house in 1896 and again in 1897, coming down the stovepipe which had a double elbow and laying in the stove: they made too much noise scratching up and down the stovepipe and so had to be discouraged. They often lay their eggs in houses put up for the martins or for pigeons and I think destroy the young birds. In May, 1908, a pair nested in the martin box at the ranch. Finding a dead martin under the box, I got a shotgun and sent a friend up the pole to investigate: an owl flew out and was promptly shot and then my friend found three young owls in the box, and brought them down, and put them under a live-oak tree in the yard. The remaining parent fed the young for a night or two on the ground, bringing them, among other things, two or three sphinx moths and a crawfish, and then persuaded them to climb into the tree. The next evening my friend was smoking after supper and the owl knocked his pipe out of his mouth. The owl next attacked the lady of the house as she was bringing in the milk, and as a final exploit struck me full in the face as I was standing near the tree, using force enough to draw blood. The next morning the whole owl family was put to death.

72. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— For so large an owl, a common resident, nesting early in the spring in a cave in a bluff, a deserted Red-tailed Hawk's nest, or on one occasion on the flattened top of a squirrel's nest. Small rabbits seem to be their principal food, but occasionally they harry the hen roosts and I have known them to kill young wild turkeys, even when half grown.

73. **Speotyto cunicularia hypogæa.** BURROWING OWL.— Seen on migration in spring and autumn but does not breed here. March 4 to April 5 and September 23 to October 10.

74. **Geococcyx californianus.** ROAD-RUNNER.— Common resident. Nests in March and April. Eggs usually 5 to 6, on one occasion 7. Sometimes one finds eggs in various stages of incubation in the same nest, but not always, as I have found 6 eggs all fresh. The Road-runner makes a loud chuckling crowing noise in the spring, and also a cooing noise that might easily be mistaken for the voice of some kind of dove; it also makes a sort of purring sound in its throat, *perrp perrp perrp*.

75. **Coccyzus americanus occidentalis.** CALIFORNIA CUCKOO.— Common summer resident; average date of arrival April 20; earliest April 9. Usually leaves in September but have seen it as late as October 19, when the fall webworm has been particularly abundant. The western form reaches here its most eastern extension.

76. **Ceryle alcyon.** BELTED KINGFISHER.— Fairly common resident.

77. **Ceryle americana septentrionalis.** TEXAS KINGFISHER.— Fairly common, breeds along the Guadaloupe and its tributaries, also along the Llano and Medina rivers. Took two eggs on May 29, 1907, from a nest on Turtle Creek. The nest hole was about 2½ feet below the top of a little adobe bluff, slanting slightly upwards for about a foot, then turning to the right for about another foot. The burrow was enlarged at the end and the eggs were on a bed of small fish bones and scales, about half a pint of this material.

78. **Dryobates scalaris bairdi.** TEXAS WOODPECKER.— Our commonest woodpecker. Took 4 eggs on April 14, 1902. This bird *drums* on a dead limb of a tree at any time of year, if the weather is fine.

79. **Sphyrapicus varius.** YELLOW-BELLIED SAPSUCKER.— Common in winter. Arrives about the middle of October.

80. **Sphyrapicus thyroideus.** WILLIAMSON'S SAPSUCKER.— Shot a male at the ranch on Turtle Creek October 24, 1898. This is the most eastern record for the State.

81. **Phlœotomus pileatus.** PILEATED WOODPECKER.— A large black "Woodcock" used to be seen occasionally many years ago frequenting the tall cypress trees that fringe the Guadaloupe River. From the description it probably belonged to this species. I never saw the bird myself.

82. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— Formerly not uncommon in winter, and possibly once nested in a post oak flat above Kerrville on the Guadaloupe. The trees are all gone now and the place is under cultivation. I have not seen one of the birds for several years.

83. **Melanerpes formicivorus.** ANT-EATING WOODPECKER.— Fairly common in winter in the post oak trees along the Medina-Guadaloupe divide, and breeds. This is considerably the most eastern record for the species.

84. **Centurus aurifrons.** GOLDEN-FRONTED WOODPECKER.— Not very common now, but resident all the year.

85. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— Common in winter. Earliest autumn record September 20 (twice). I have shot flickers with red and also with black moustaches but have never seen any that were not red under the wings.

86. **Antrostomus carolinensis.** CHUCK-WILLS-WIDOW.— Common breeder; earliest date of arrival April 3; average April 13. Have found fresh eggs April 30.

87. **Antrostomus vociferus.** WHIP-POOR-WILL.— I have only four records for this bird — April 18 and 23, and September 15 and 19.

88. **Phalænoptilus nuttalli.** POOR-WILL.— Common. A few of these birds must sometimes spend the winter with us as I have heard them every month in the year except November. They usually arrive early in February. The latest date of arrival I have (for twenty years) is March 13. I have found eggs as early as March 22.

89. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.— Common breeder. Earliest record, April 12; next earliest, April 23; average, about April 29.

90. **Chætura pelagica.** CHIMNEY SWIFT.— Have only seen them on two occasions, April 29, 1894, and May 8, 1896.

91. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.— Seen every year in April on the buck-eye blooms. I do not think it breeds here but am not quite sure about it. I have never seen a *male* hummer near a nest.

92. **Archilochus alexandri.** BLACK-CHINNED HUMMINGBIRD.— Common. Earliest arrival, March 11; average date of arrival, about March 20. Latest in autumn, October 26. On April 1, 1900, I watched a hummer starting the foundation of her nest; the next day she had nearly finished the wall of the nest and she had it completed by the 6th and was sitting on the 9th of the month. On April 30 I watched her feeding the young ones; the little fellows stretched their necks to the fullest extent and the old bird put her bill full length down their throats. The young had left the nest on the morning of May 11. The male bird never came near the nest. A new nest is frequently built on the top of an old one.

93. **Muscivora forficata.** SCISSOR-TAILED FLYCATCHER.— Common, especially in the valleys. Earliest spring record, March 20 (twice); average, March 25. Latest autumn record, October 17. I have seen a family party of them eating the berries of the poke weed which are here supposed to be poisonous.

94. **Tyrannus tyrannus.** KINGBIRD.— Not very common in the county but a few pairs breed here. Earliest record, April 22; average, April 26. A nest with bird sitting on it, May 16.

95. **Tyrannus melancholicus couchi.** COUCH'S KINGBIRD.— A male shot at the ranch, September 11, 1908, extends greatly the known range of the species in Texas.

96. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Not uncommon in migration, spring and autumn, though we are at the extreme eastern

limit of the range of the species. Earliest spring record, April 24; latest, June 6. Earliest autumn record, August 30; latest, September 22. It is a very silent bird here and although seen as late as June 6, I do not think it has bred here, at least not near the ranch.

97. **Myiarchus crinitus.** CRESTED FLYCATCHER.— Fairly common in spring and probably breeds.

98. **Myiarchus cinerascens.** ASH-THROATED FLYCATCHER.— Fairly common breeder.

99. **Sayornis phœbe.** PHŒBE.— Common in winter and several pairs usually breed in the bluffs along the creeks. We are close to the extreme southwestern breeding range of the species in Texas.

100. **Sayornis sayus.** SAY'S PHŒBE.— Not common; I have only seven records for it: February 26, March 5, April 7, 13 and 26, and December 11 and 25.

101. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— Only one record, August 19, 1903.

102. **Myiochanes virens.** WOOD PEWEE.— Common breeder; earliest spring record, April 9; next earliest, April 14; average, April 20.

103. **Empidonax virescens.** ACADIAN FLYCATCHER.— Not very common, but breeds regularly near the ranch. Earliest spring record, April 12; next earliest, April 21; average, April 30. Nests on a horizontal fork of a small branch, a rather neat little saucer-shaped arrangement; one can often see the eggs through the bottom of it.

104. **Pyrocephalus rubinus mexicanus.** VERMILION FLYCATCHER. — I saw a pair of these birds and their nest at a neighbor's house on Turtle Creek on June 8, 1903, and was told that they had already raised one brood that year. They were building again in the same live-oak tree on April 14, 1904. The male bird has a nice little song and sometimes sings when on the wing. This is the most northern breeding record for Texas.

105. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.— I have sometimes seen Horned Larks on an open piece of ground just below Kerrville on the Guadaloupe. They are probably not uncommon along the river valley.

106. **Cyanocitta cristata.** BLUE JAY.— Several flocks of Blue Jays visited us in January and February, 1887. Again in October and November, 1896, they were quite common and remained that winter until as late as April 25, 1897. I have never seen the bird here except on those two occasions.

107. **Aphelocoma texana.** TEXAS JAY.— The type of this species is a bird I sent to Mr. Attwater, killed at the head of the Nueces River when I was deer hunting. These birds are fairly common on the rough hilly land west of Kerrville and breed at the ranch: they nest late in March and early in April and lay 3 to 5 eggs, usually 4.

108. **Corvus cryptoleucus.** WHITE-NECKED RAVEN.— Formerly very common in Kerr County but now quite a rarity. I have counted as many as fifteen at the carcass of a deer that I had killed the day before.

I do not know whether the Crows had anything to do with the fact that the Ravens left us, but the year that the Crows appeared for the first time on Turtle Creek was the last year that the Ravens bred there. Kerr County marked their extreme eastern breeding range in Texas.

109. **Corvus brachyrhynchos.** CROW.— Crows were not uncommon along the Pedernales River in Gillespie County in the early eighties, but I never saw them along the Guadaloupe until February, 1897, when a pair or two took up their abode near Kerrville; since then they have increased and several pairs breed in the neighborhood. They first nested on Turtle Creek in 1898. The last pair of White-necked Ravens nested there in 1897.

110. **Molothrus ater.** COWBIRD.— The form which occurs here commonly in migration and rarely in winter is certainly the eastern bird. Whether our breeding bird is this form or the Dwarf Cowbird (*M. a. obscurus*) has not yet been determined.

111. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— Common migrant in April; occasional in the autumn.

112. **Agelaius phœniceus.** RED-WINGED BLACKBIRD.— Occasionally in large flocks in February, March and April; sometimes I do not see it all the winter. I know of no nesting place nearer than San Antonio.

113. **Sturnella magna.** MEADOWLARK.— Common winter resident.

114. **Sturnella neglecta.** WESTERN MEADOWLARK.— Common in winter, but I have not known them to nest here.

115. **Icterus spurius.** ORCHARD ORIOLE.— Quite common breeder; earliest record, April 13; average, April 17. One of the most regular of our birds in its times of arrival.

116. **Icterus galbula.** BALTIMORE ORIOLE.— A fine male and three females or young birds came to the ranch on September 9, 1908. I have only seen it here on one other occasion.

117. **Icterus bullocki.** BULLOCK'S ORIOLE.— Not uncommon among the mesquites in the northwest corner of the county, and breeds there; have seen it only twice in the neighborhood of Kerrville.

118. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Common in winter.

119. **Hesperiphona vespertina** subsp.? EVENING GROSBEAK.— Seen once, January 31, 1905. This is the only record of the species for Texas and unfortunately there can be no certainty as to the subspecies. But since the known range of the western form, *montana*, is much nearer than the district where the eastern form usually winters, the probabilities are strongly in favor of the western bird.

120. **Astragalinus tristis.** GOLDFINCH.— Common in winter; leaves us just as the males begin to put on their summer plumage, usually about the first week in March.

121. **Astragalinus psaltria.** ARKANSAS GOLDFINCH.— Nests quite commonly in the pecan and walnut trees at the ranch, often quite close to the house: there are usually four eggs in the nests somewhere about the first week in June. Earliest spring record, March 29; next earliest,

April 18; average, April 28. Leaves about middle of October; latest record, November 9.

122. **Spinus pinus.** SISKIN.— Occasional in flocks in winter and spring, November 28 to May 29.

123. **Calcarius ornatus.** CHESTNUT-COLLARED LONGSPUR.— Fairly common in the wider valleys and open places on the divide in winter and spring.

124. **Poœcetes gramineus confinis.** WESTERN VESPER SPARROW.— A common bird by the roadsides in winter; arrives about October 22.

125. **Passerculus sandwichensis alaudinus.** WESTERN SAVANNAH SPARROW.— Not at all common migrant at the ranch.

126. **Ammodramus savannarum bimaculatus.** WESTERN GRASSHOPPER SPARROW.— Probably fairly common in the open parts of the county in winter. I have shot them on two or three occasions when quail hunting; a young dog will nearly always point them.

127. **Chondestes grammacus strigatus.** WESTERN LARK SPARROW.— Very common in summer and occasionally seen in midwinter. Average date of arrival, March 12.

128. **Zonotrichia querula.** HARRIS'S SPARROW.— Occasional in winter but not common.

129. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.— Common in spring. Have seen it on October 29 and in February. It is commonest in March. Latest seen April 24.

130. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— My only record is that of a pair seen March 16, 1907.

131. **Spizella passerina.** CHIPPING SPARROW.— Common in winter and a few pairs regularly breed in the Kerrville neighborhood. Have twice taken eggs at the ranch. The breeding bird is the eastern form, here finding its western limit in Texas. The winter birds undoubtedly include individuals of the Western Chipping Sparrow (*Spizella passerina arizonæ*).

132. **Spizella pallida.** CLAY-COLORED SPARROW.— Small flocks frequently visit us during March and April. Have seen it as late as April 24.

133. **Spizella pusilla.** FIELD SPARROW.— Common resident.

134. **Junco hyemalis.** SLATE-COLORED JUNCO.— Snowbirds are common in winter. Earliest date of arrival, October 30; average, November 8.

135. **Amphispiza bilineata.** BLACK-THROATED SPARROW.— Not common: I have not seen it in the Guadaloupe valley, but it breeds in the mesquite flats on the heads of the Llano River, in the northwestern corner of the County.

136. **Peucæa cassini.** CASSIN'S SPARROW.— A few pairs used to nest in the Turtle Creek valley, but have not done so for the last year or two. The species is fairly common in summer on the opener parts of the Guadaloupe-Llano divide. Its cheery little song is unlike anything else, and once heard can never be forgotten.

137. **Aimophila ruficeps eremœca.** ROCK SPARROW.— Rather common resident of the brush covered hills. Eggs three to five; have found them early in April and late in June, so the bird probably raises two broods.

138. **Melospiza melodia.** SONG SPARROW.— Not very common. A few winter along the little creek that flows by the ranch house.

139. **Melospiza lincolni.** LINCOLN'S SPARROW.— A common winter resident at the ranch. Earliest autumn record, September 23; average, October 10. Have seen it as late as May 15. It sometimes sings in a tentative sort of way just before leaving us.

140. **Passerella iliaca.** FOX SPARROW.— A not very common winter visitor in the valley thickets.

141. **Pipilo maculatus arcticus.** ARCTIC TOWHEE.— A common winter resident in the brush, both on the hills and in the valleys. Earliest autumn record, October 6; average, about October 15; stays with us until the middle of May.

142. **Pipilo fuscus mesoleucus.** CAÑON TOWHEE.— Rather rare in the neighborhood of Kerrville but breeds, at least occasionally, on Turtle Creek; quite common in the northwestern corner of Kerr County reaching here its most eastern extension in Texas.

143. **Cardinalis cardinalis canicaudus.** GRAY-TAILED CARDINAL. — Quite common resident.

144. **Zamelodia melanocephala.** BLACK-HEADED GROSBEAK.— Only seen once; a fine male, May 6, 1907, the most southeastern record for Texas.

145. **Guiraca cærulea lazula.** WESTERN BLUE GROSBEAK.— Quite common in summer and breeds at the ranch. Earliest spring record, April 12; average, April 18. I fancy the males arrive a few days ahead of the females; have seen a flock of five males at least a week before a female appeared.

146. **Passerina cyanea.** INDIGO BUNTING.— Fairly common and breeds at the ranch. Earliest spring record, April 10; latest, April 30; average, April 20. It finds here the southwestern limit of its breeding range.

147. **Passerina amœna.** LAZULI BUNTING.— Rather rare. A few pairs have occasionally bred at the ranch. Earliest spring record, April 23; average, April 24. Nests with four eggs May 15 and May 26. This is the most eastern breeding record for Texas though it has been taken in migration east nearly to San Antonio.

148. **Passerina ciris.** PAINTED BUNTING.— Common at Kerrville and along the Guadaloupe Valley. Not quite so common at the ranch. Earliest record, April 23. It is one of the earliest birds to leave us in the fall.

149. **Spiza americana.** DICKCISSEL.— Fairly common during the spring migration. If we have plenty of spring rains it stays with us a few weeks; if dry it passes on overhead. Earliest record, April 23; latest, May 23. Probably used to breed here formerly.

150. **Calamospiza melanocorys.** LARK BUNTING.— Not uncommon in the valleys and open places in the spring. Have seen it as late as May 3.

151. **Piranga rubra.** SUMMER TANAGER.— Common breeder. Very regular in its appearance in the spring. I have seventeen records of spring arrival, varying from April 11 (four times), to April 15 (three times); average, April 12. Many years ago a boy at the ranch amused himself by killing these birds that were decimating the bees belonging to a few bee-stands in the yard; he shot some six or seven birds and among them one female considerably larger than any of the others.

152. **Progne subis.** PURPLE MARTIN.— Not so common as it was years ago. Twenty years' records, earliest, February 11; average, February 20. Leaves as a rule during late July or the first week in August, latest seen August 25.

153. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Breeds in large colonies on many of the bluffs along the rivers and creeks and tries to build on the rock buildings in Kerrville but meets with no encouragement. I see them at their breeding places about the middle of April; they leave us early in August.

154. **Hirundo erythrogastra.** BARN SWALLOW.— Rather rare; I do not often see it; quite a number of years ago a pair nested under the porch of a house in Kerrville.

155. **Bombycilla cedrorum.** CEDAR WAXWING.— Quite common in winter and usually stays around Kerrville until it has eaten all the mulberries in the gardens there. Usually arrives about November 1; earliest record, October 19; latest, May 23.

156. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE. — Not uncommon in winter. Breeds on the divide between Guadaloupe and Pedernales rivers. Have not found it breeding south of the Guadaloupe River. It comes to us early in August.

157. **Vireosylva olivacea.** RED-EYED VIREO.— Common breeder. Earliest spring record, March 25; next earliest, March 30; average, April 12.

158. **Lanivireo flavifrons.** YELLOW-THROATED VIREO.— Not uncommon; breeds at the ranch. Earliest record, March 15; average March 24. This is at the extreme southwestern limit of the breeding range.

159. **Lanivireo solitarius.** BLUE-HEADED VIREO.— Rare in spring migration; April 20 and May 9.

160. **Vireo atricapillus.** BLACK-CAPPED VIREO.— Not uncommon; several pairs usually breed at the ranch. I fancy, however, that the bird is not so common as it was a few years ago. Earliest record, March 19; average, March 24. I have several times found the nests early in May, containing three eggs as a rule, and situated 2–5 feet from the ground.

161. **Vireo griseus.** WHITE-EYED VIREO.— Very common breeder. Earliest record March 6; average date of arrival, March 16.

162. **Vireo belli.** BELL'S VIREO.— Rather rare in the neighborhood of Kerrville, but quite common in the mesquites on the banks of the

Llano River in the northwestern corner of the County. I have records at the ranch for April 19 and 28, May 5 and August 20.

163. **Mniotilta varia.** BLACK AND WHITE WARBLER.— Not uncommon and breeds with us; I see it feeding young every year — one of these times was June 10, 1897 — but have not found a nest. Earliest record, March 5; average, March 11. Latest record September 26.

164. **Vermivora rubricapilla.** NASHVILLE WARBLER.— Not uncommon in late April and early May.

165. **Vermivora celata.** ORANGE-CROWNED WARBLER.— Flocks of small warblers, principally of this species, pass through the woods from late in March until the end of April. I have several times picked up dead ones after a hail storm.

166. **Compsothlypis americana usneæ.** NORTHERN PARULA WARBLER.— A common summer resident at the ranch: nests in hanging tufts of tree moss. Earliest record, March 9; next earliest, March 15; average, March 21. On April 22, 1907, I picked up three dead young birds under a nest, after a cold rain; they would have been able to fly in a few days.

167. **Dendroica æstiva.** YELLOW WARBLER.— Fairly common in migration, both spring and autumn. Earliest record, April 18; next earliest, May 2; average, May 5. Have seen it back again as early as August 18.

168. **Dendroica coronata.** MYRTLE WARBLER.— Frequently spends the winter with us: leaves at the end of April, by which time it is in full summer plumage and may often be heard singing. Latest record, April 28.

169. **Dendroica dominica albilora.** SYCAMORE WARBLER.— Frequents the tall cypress trees of the Guadaloupe valley, and breeds there in some numbers, though this is at the extreme southwestern limit of the breeding range. Earliest spring record, March 18; average, March 22.

170. **Dendroica chrysoparia.** GOLDEN-CHEEKED WARBLER.— About as common as any warbler in the county. Earliest spring record, March 5; average, March 12. Usually has eggs in the nests during the first week in April; have seen young birds out of the nest by April 22: have also found eggs in May, so the bird may be double-brooded. Nests usually perhaps in cedar, but have often found them in oak and walnut trees. Early in July the woods are full of family parties; as a rule they are all gone before August 1. Have only seen the bird two or three times after that date. Latest records, August 20 (once), August 10 (once).

171. **Dendroica virens.** BLACK-THROATED GREEN WARBLER.— Rather rare; the few I have seen have been observed between May 7 and 15.

172. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH.— Once at the ranch, on May 10, 1895.

173. **Seiurus motacilla.** LOUISIANA WATER-THRUSH.— Not common migrant. Have seen it March 18–26, also May 3, and two or three times in the autumn.

174. **Oporornis formosus.** KENTUCKY WARBLER.— Rather com-

mon in the river and creek bottoms. Earliest spring record, April 10 (twice); average, April 15. Have found the nest on several occasions, one with four fresh eggs on May 7. This is the most southwestern breeding record of the species.

175. **Geothlypis trichas.** MARYLAND YELLOW-THROAT.— Not very uncommon in migration; have seen it from April 29 to May 15.

176. **Icteria virens.** YELLOW-BREASTED CHAT.— Very common all the summer. Earliest record, April 9 (twice); average, April 13. Earliest nest with fresh eggs, May 6. Reaches here the western limit of its range in Texas.

177. **Setophaga ruticilla.** REDSTART.— Rare, at the ranch; May 2 and September 15 and 26 are my only dates.

178. **Anthus rubescens.** PIPIT.— Common in the fields all the winter.

179. **Oreoscoptes montanus.** SAGE THRASHER.— See a few every winter and at times they are quite common.

180. **Mimus polyglottos leucopterus.** WESTERN MOCKINGBIRD.— Common all the year.

181. **Dumetella carolinensis.** CATBIRD.— Only seen twice by me, September 8 and October 17. Mr. Vernon Bailey saw one here on May 5, 1899.

182. **Toxostoma rufum.** BROWN THRASHER.— Only seen twice; February 10 and March 5, 1899: on the latter occasion I saw three birds together. This is the most southwestern record of the species.

183. **Salpinctes obsoletus.** ROCK WREN.— Not very common, but sometimes breeds at the ranch.

184. **Catherpes mexicanus conspersus.** CAÑON WREN.— Common along the bluffs of the river and creeks, and occasionally seen round the rock buildings in Kerrville. For two years a pair lived with us in the ranch house and became very tame, hopping about the floor and even singing on the table while we were in the room. They nested over one of the windows.

185. **Thryothorus ludovicianus.** CAROLINA WREN.— Common resident. This bird also has nested and reared its young in the house on two or three occasions.

186. **Thryomanes bewicki cryptus.** TEXAS WREN.— Another very common bird; we have a nest or two every year under the "gallery." I have twice found nests built in the skull of a dead cow.

187. **Troglodytes aëdon parkmani.** WESTERN HOUSE WREN.— Occasional in winter and spring. It does not breed with us.

188. **Telmatodytes palustris iliacus.** PRAIRIE MARSH WREN.— Some years ago I frequently saw some of these birds in a rushy piece of ground on Turtle Creek. The rushes have gone and the birds with them. I have seen them on Feb. 12 and May 4. I do not think that they bred there.

189. **Certhia familiaris americana.** BROWN CREEPER.— Not very common. I see a bird or two nearly every winter.

190. **Sitta carolinensis.** White-breasted Nuthatch.— The bird is not common here, but I have seen it when on hunting trips in November among the post oak trees at the head of Turtle Creek and along the Medina-Guadaloupe divide.

191. **Bæolophus atricristatus sennetti.** Sennett's Titmouse.— Quite common resident.

192. **Penthestes carolinensis agilis.** Plumbeous Chickadee.— Common resident. This is nearly its extreme southwestern limit.

193. **Auriparus flaviceps.** Verdin.— Not seen at Kerrville, but have seen it and its nest close to the line between Kerr and Kimble counties, northwest from Kerrville, where it finds the northern limit of its range.

194. **Regulus satrapa.** Golden-crowned Kinglet.— Not common, but occasionally seen in small flocks in winter.

195. **Regulus calendula.** Ruby-crowned Kinglet.— Common in winter. Earliest record, October 2. Stays with us until early in May. I never saw this bird in small flocks like *satrapa*, but always singly or in pairs.

196. **Polioptila cærulea.** Blue-gray Gnatcatcher.— Common and breeds throughout the county. Earliest date of arrival, March 13; average, March 17. They begin nesting almost as soon as they get here; I have found nests in course of construction on March 30 and with eggs in them as early as April 4.

197. **Myadestes townsendi.** Townsend's Solitaire.— A rare bird here as a rule, and I had seen only two or three specimens of it until 1905, when it was quite common at the ranch from January 26 until April 25. This was the first record of their being seen in numbers so far south in Texas. There was a great quantity of cedar mast that year. They appeared here again on November 2, 1910, and are fairly common at the time of writing this note, January 25, 1911. There are plenty of cedar berries again this season.

198. **Hylocichla guttata** subsp.? Hermit Thrush.— At least two and probably three subspecies of this bird are common here in winter.

199. **Planesticus migratorius.** Robin.— Common in winter especially when there are many berries. A few winters ago these birds did good service by picking up the army worms that were destroying the young grain crops. They usually arrive about the first of November and stay until April; latest date, April 21. They sing here all the winter when the weather is mild.

200. **Sialia sialis.** Bluebird.— Common and breeds here; nests with eggs early in April; much more numerous in winter than in summer.

201. **Sialia currucoides.** Mountain Bluebird.— About three times since I have been living here this bird has been fairly common in the winter, otherwise we never see it: it goes about in larger flocks than *sialis* does. We are here near the eastern limit of the range of the species in Texas.

202. **Passer domesticus.** ENGLISH SPARROW.— In 1882 we saw the English Sparrows at Galveston and Houston. They came to Kerrville on December 12, 1897, and came to stay. They nested at the ranch for the first time in 1909, but were often here in the winter long before then.

A DROP OF FOUR THOUSAND FEET.

BY FLORENCE MERRIAM BAILEY.

OUR last mountain camp of the field season of 1906 was at 8500 feet in the New Mexico Mogollons. Even in New Mexico an 8500 foot camp after the middle of October is apt to be a trifle chilly, so we pitched our tents on the warm slope of the cañon under the yellow pines, laying logs against the outside walls of the tents to keep out the wind, and noting with satisfaction that there was abundant fuel close at hand for big camp fires. A few rods below the tents Willow Creek — a clear sparkling mountain brook that heads the middle fork of the Gila — ran at the foot of a handsome fir and spruce wall whose crest at sunset caught the last yellow light slanting across the forest.

In the morning when the sun reached the trees in front of the tent small voices would be heard and a flock of hardy mountaineers — Chickadees, Pygmy Nuthatches, and Brown Creepers — would fly in filling the air with their gentle talk. Beyond camp up the narrow winding gulch of Willow Creek along which was kept a line of small mammal traps, in the sunny bends of a morning Chestnut-backed Bluebirds and Audubon Warblers would fly before us and flocks of Juncos rise with a startled twitter and a flash of white outer tail feathers. Some of the Juncos when flying showed a band of pink along the sides and, as was proved when our specimens reached the Biological Survey, representatives of nearly every resident, migrant, or wandering Junco of those mountains, including the Slate-colored, Intermediate, Montana, Pink-sided, Ridgway's, and the Gray-headed, had gathered in that particular gulch or its neighborhood on the approach of winter. It was such good hunting ground that a Sharp-shinned Hawk was taking advantage of it.

A Dusky Grouse had been seen on the way into the mountains, recently made tracks were discovered on the bank of Willow Creek, and fresh sign was found later on the ridges above; but most of the birds had probably been killed off by the summer hunting. The Wild Turkeys that were left in the mountains doubtless went below to escape the storms for no tracks were seen except when we first reached Willow Creek, and some prospectors who came up the Gila told us that they had encountered a large number below, including bronze-colored gobblers.

Well protected by their fur coats, small mammals were plentiful. Twenty-four specimens were found in the line of traps along the gulch one morning, including a shrew, and various small mice and wood rats; while saucy red squirrels scolded us from the evergreen tops over the brook, and one day when camp was quiet two handsome gray Abert squirrels with long winter ear tufts chased each other around and around a yellow pine trunk.

Attracted perhaps by the abundance of small mammals were several hawks and owls — a Sparrow Hawk, three Red-tails, one a very black melanistic bird, a Pygmy Owl, and a pair of Spotted Owls. The Spotted Owls apparently made their home in the firs and spruces on the wall of Willow Creek, for their curious varied calls were heard at camp nearly every night, often just at daybreak, and once before dark; so different from the Horned Owl that it was noticed by the camp man. "He's not the owl that makes that hootin' noise?" the puzzled listener asked. On moonlight nights the two birds were heard answering each other, a soft conversational *who-who-who-who-who-who-who*, being replied to by a sharp *wheck-wheck-wheck-wheck-wheck*. One of the commonest calls was a short bark, and another was *who-who-whoo'* the last *whoo* brought out with great emphasis. When some new calls from the varied repertoire of Strix were heard, the man looked up. "That aint the kind o' tune he played the other night, is it?" he asked, and then as the concert continued — "What makes him make such a noise? I should think he'd scare away all his game."

In the day time flocks of striped Pine Siskins — on two days a band of probably a hundred birds — wandered up and down the creek, now in a compact flock, now straggling out; stopping to visit the cone-laden spruce tops, then going on to the alders where, bending over the little cones they showed their yellow wing bands, then up and away giving their lovely eolian call on the wing. The unmistakable welcome notes of a flock of Crossbills were also heard in the cañon.

Robins, Ruby Kinglets, Long-crested Jays, and a number of Woodpeckers were seen in the region. Borings apparently of the Pileated were found in the timber from 8500 to 9600 feet, and the Alpine Three-toed Woodpecker was found at 10,500 feet. At about 11,000 feet a Cassin's Finch was shot.

While we were absorbed in watching the birds and beasts of the cañon, heavy winds and black clouds gathering around the mountain tops were followed by snow, and a Clarke's Crow came down from the peaks to the tree tops above camp. The next morning ice was an inch thick on the water pail, and in the cold dark cañon one pool was frozen so deep that it held the weight of a man. By some open water an Ouzel stood on a stone with its feathers fluffed up. But though looking cold it flew down into the water, hopped out onto a cake of ice and stood there as unconcernedly as if on a sun-warmed rock.

More snow fell and it kept getting colder till on the morning of the twenty-fourth of October — the day after the last thrush was seen — the mercury stood at 14° Fahr. by our camp thermometer which registered so little below that the temperature was probably nearer zero. That day Mr. Bailey ran a zone line to the top of the 11,000 foot peak above us, and saw white-tailed deer and followed tracks of a mountain lion through the snow. Down in camp it was cold work writing up notes even with big logs blazing in front of the tent.

When the snowstorms had cleared the sky we had glorious days. The air was as clean and strong as on a mountain top and the sky such a deep dark blue it was hard to keep one's eyes on the ground. At night in the evergreen openings, the moonlight on the snow was doubly good to look at in New Mexico, and revived memories of beautiful white northern winters.

But soon a second storm began gathering around the peaks, black clouds hanging low over them and wind whistling through the spruces. If we stayed till the storm came we might get snowed in. It was now the last of October and the Forest Ranger at Mogollon had said that it was "generally hard to get in or out of this country after the first of November," that sometimes the snow was seven feet deep here. To provide against trouble he had given us the key to a cabin two miles below that held emergency supplies, but we were not prepared for winter and having no snowshoes, if caught by a storm might have to wade seventeen miles through the snow. We decided to go out while we could drive out!

Breaking camp in a cold rain we climbed 500 feet up a steep wet trail to the top of the cañon and the wagon road; and the next morning after driving across long miles of a road recognized as fit only for pack trains, went down 2600 feet on a steep slippery lumber grade to the mining town of Mogollon near which we spent the night; the following morning climbing up 450 feet, and then dropping down the 1500 foot Mogollon grade across the rocky face of the bare southwest slope of the mountains — a striking contrast to the heavily-timbered northeast slope from which we had come — we finally reached the stage station of Glenwood at the junction of White Water Creek with the San Francisco River.

We had come down 4000 feet in twenty-eight hours, from 9000 feet at the top of Willow Creek Cañon to 5000 feet at the foot of the Mogollon Mountains. After rattling down the cold mountain grades we were glad to camp here for a few days work, pitching our tents in a little amphitheater that was warm and still, and filled with sunny nut pines and junipers. Bordering the river below us were glistening live oaks and broad-leafed cottonwoods that glowed with a lovely languorous yellow in the warm afternoon sunshine while cobwebs floated on the quiet air and the gentle voices of lowland Quail made sweet music. Looking back up the Mogollons, storm clouds shrouding the peaks made us thankful that we had escaped in time. It was pleasanter to sit safe and warm below and watch the pink sunset light on the mountains than to be wading in seven feet of snow!

"The grasshoppers are squeaking up on the hill!" some one called out, and after a moment, the camp man's deliberate voice responded dryly — "We did n't hear many over on *Willow Crick!*"

From listening to Spotted Owls barking from the moonlit firs and spruces of the snow-covered Canadian cañon above we now listened to Sonoran Bush-tits and Gambel's Quail among the nut pines and junipers. A flock of the Quail roosted not far from our tent in the protected amphitheater and when gathering in and getting settled at dusk, above the variously accented calls rose one in anxious high-pitched tones drolly like a distracted voice calling *Where-are-you-'now? Where-are-you'-now?* Soon after daylight, hearing small voices approaching and raising our heads from our sleeping bags we saw an advancing procession of the plump Quail with recurved top knots over their bills, their black throats and buffy belly patches conspicuous as they faced us. On they came, talking in low tones, but suddenly a warning *tut, tut,* interrupted their conversation. They had discovered the cook at his camp fire! A few steps more and they stopped, standing in two pretty squads under the junipers.

Just over the bank another flock of about twenty-five Quail were flushed from a field bordering the San Francisco, the Rio San Francisco which we had forded fifty-two times in one cañon a few weeks before! Following up the banks of the river we found Meadowlarks, Killdeer, and Ravens, and spoke with an old hunter going to a pond back of the dam for Teal; but then we came to a cañon where the swift stream with its usual disregard of travelers was swinging against one and then the other of its sheer walls, so we turned off into a dry gulch. The gulch proved to be richly wooded with sycamore, ash, box elder, cottonwood, mulberry, live oak, and soapberry, and was so full of birds that it was hard to leave. There were Woodhouse Jays squawking, a little Texas Woodpecker with barred back giving its shrill call as it drilled on the oaks, Audubon Warblers jerking out their sharp *tchack'*, Gray Titmice whistling, and fascinating little Bridled Titmice flitting about the trees singing a tinkling Chickadee song; while invisible Cañon Towhees, Rock Wrens, and a Scott Sparrow kept us peering up the stony banks of the gulch. On a mesquite flat above the gulch Pipits from the peaks were seen.

We had left the snowy Canadian mountains deserted by all but a few of the hardier birds and by our 4000 foot drop, paralleling the vertical migration, had come down into the warm Sonoran valley where the weeds were still full of seeds and the trees of berries, and birds were gathered in happy throngs. They were everywhere. The air was full of their calls and fall songs, and wherever you went, from weed, bush, and tree they flew before you. The weed patches were rustling with Juncos, Chewinks, and Sparrows, Song and White-crowns — no White-crowns had been seen on Willow Creek after the first snowstorm and only one Song Sparrow had been heard. The junipers and nut pines were full of talkative Bush-tits, chattering Ruby Kinglets sometimes giving a snatch of song, and House Finches and Bewick Wrens singing gaily — what a clear loud ringing song the Wren has! Bluebirds (*bairdi*) were seen on all sides. There were Robins, Mourning Doves, Flickers, Horned Larks, Say's Phœbe, Cañon Wrens, flocks of Goldfinches and Redwings, and a variety of Hawks — Red-tailed, Sparrow, Sharp-shinned, and Marsh — while Solitaires whistled a clear one-syllabled *hip, hip, hip,* and on warm days gave their full fall song. Brown Creepers were seen 3500 feet lower than they had been noted a few days before, and one was actually found on a Lower Sonoran mesquite instead of his native Canadian fir and spruce. A small flock of Siskins also reminded us of Willow Creek, but instead of cone seeds they were eating sunflower seeds.

Ignorant of the fact that most of the birds had left the mountains, a boy whom we saw was planning a hunting trip to them with a freighter. He was going to take one burro just for ammunition, he boasted, for he shot everything he saw down to snowbirds!

On the freight road our attention was attracted to a dooryard with a flagpole flying an American flag — unusual in rural New Mexico — and still more surprising, two stuffed White-faced Glossy Ibises perched on the fence! Inside the house we were pleased to find a family of Germans. The Ibises, together with a Blue Heron which stood on the parlor mantelpiece, had been shot along the river — which added to our list of valley species. The apologetic taxidermist said the birds were so handsome she wanted to save them, and having nothing better had put them up with tobacco and camphor gum, making eyes for the Ibises with black buttons and yellow satin!

At the next stage station, Lee's Station, a ranch just below the juniper and nut pine slopes of the mountains to which the Wild

Turkeys come, the old man Lee who kept tame turkeys told us of an amusing experience he had had the previous night. He had gone up the gulch back of his house and while there had seen an old gobbler, and thought he'd drive him home. But when approached the turkey ran away from home — and when chased got up and flew! Surprised at this strange behaviour the old man went on down to the ranch. Passing his hen house he looked in and — there was his gobbler inside! Perhaps the turkey he had chased was one whose tracks we had seen on Willow Creek!

NOTES ON THE FRUIT-EATING HABITS OF THE SAGE THRASHER IN THE YAKIMA VALLLEY.

BY CLARENCE HAMILTON KENNEDY.

THE broad sage-covered stretches of the lower Yakima Valley, with the barren hills enclosing it, lie in the Transition and Upper Sonoran Zones. Only a narrow strip a few miles wide down the center of the valley has been reclaimed by irrigation and the brown desert displaced by green fields and orchards.

It is in this sage brush land above the irrigated area that the Sage Thrashers (*Oreoscoptes montanus*), after arriving in the spring, nest and live until the young are capable of extended flight. During the nesting period they are the best singers of any of the sage brush inhabitants. They are also the most wary, for seldom can a person on foot approach one nearer than fifty yards.

During the latter half of May, families of Sage Thrashers drift down into the irrigated ranches and begin their season of fruit-eating with the black-cap raspberries, which are then beginning to ripen. By this time the young, though still associating with the older birds, are capable of searching out their own food. With this independence of the young, the habits of the Sage Thrashers change very markedly. After this the snatches of whimsical song are rarely heard. From birds with a burst of song after every short flight they change to the most silent of birds. During the entire summer's observation I have heard no call of any kind and on but two occasions during this period have I heard a short burst of song. Their shyness also leaves them. They become as approachable as Robins in an eastern dooryard. They will sit and without fear eat berries within a few feet of pickers.

Immediately following the raspberries come the blackberries. Both are devoured with equal readiness. Sour red berries are eaten as readily as the riper black ones. The berries are eaten whole and because of their size many of those picked off fall to the ground and are lost. After the blackberry season there is a period of two or three weeks when no small fruits are ripe. During this time the Thrashers stay about the ranches but content themselves with an insect diet.

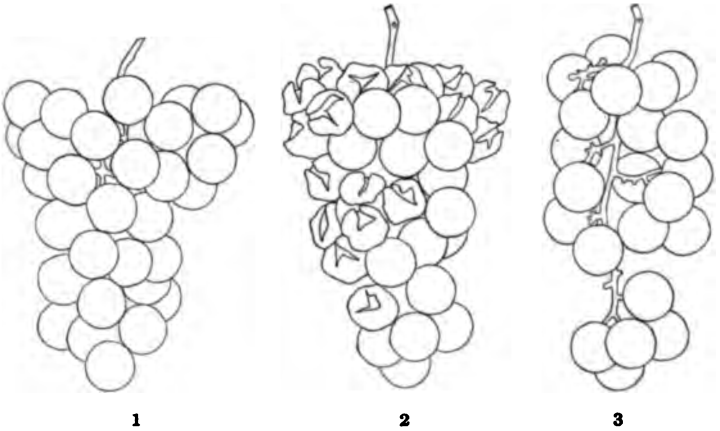


Fig. 1. A perfect bunch of Campbell's Early grapes.
" 2. Campbell's Early damaged by Sage Thrashers.
" 3. A damaged cluster after having been trimmed.

At the end of this interim, the latter part of July, the early grapes begin to color. At first they pass unnoticed but by the time one half of the clusters are purple the Thrashers have commenced to peck them. Usually they break the skin and sip the juice but occasionally a grape is eaten whole. After the feeding on grapes commences the vineyard is never free from Thrashers, which fly up from the vines to near posts and silently watch any intruder. While during the earlier summer they flock in what are probably family groups, during the latter part of the summer no flocking occurs, though as many as a dozen individuals may be seen in the vineyard at one time, which on being driven out fly each in a different direction.

On this ranch there are 140 vines of Campbell's Early. The actual loss in weight of grapes through bird damage was 25 %, but the loss in profits was not less than 50 % because of the large item of labor in trimming damaged clusters, and the loss in fancy value through the unattractive appearance of the trimmed bunches (Figs. 1–3). By September 1 the Campbell's Early were gone, and the Thrashers began to eat the foreign (*Vitis vinifera*) grapes in a mixed vineyard, the black varieties of which were beginning to color. The black varieties, Black Hamburg, Cornichou and Ramonia were damaged, as was also the Flame Tokay, a red grape. At no time did the birds injure any green or yellowish varieties, for among the *vinifera* varieties the Muscat, Malaga and Thompson's Seedless were untouched, while among the domestic varieties, the green-colored Moore's Diamond and Niagara were uninjured. Of red grapes the foreign Flame Tokays were damaged some just after coloring and while yet sour, but the red honey-like Delawares were untouched. The 140 vines of Campbell's Early, which were so badly damaged, were in the center of four acres of Concord grapes, which were entirely untouched. The explanation of this seems to be that the Thrashers prefer a grape with the two characteristics, a dark color and sourness. Concord grapes lose their acidity on first turning color, while Campbell's Early have a sprightly sub-acid flavor until fully ripe. Furthermore the red Flame Tokays were unmolested after they had ripened to sweetness.

Ten stomachs were examined with the following results:—

	Fruit in Stomach	Insects in Stomach
[1] 1	Grape pulp, skin, 2 seeds	1 locust
2	Grape pulp, skin, 4 seeds	1 large beetle, numerous ants
3	Grape pulp, ——, 4 seeds	
4	Grape pulp, skin, 2 seeds	
5	Grape skin	1 locust, 3 ants, remains of other ants

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[1] Nos. 1–5 killed Aug. 20, 10 A. M. to 3 P. M.;

	Fruit in Stomach	Insects in Stomach
[1]6	2 Grape skins, 1 seed	1 beetle
7	Grape skin, Chinese lettuce seed	
8	Grape skin	1 ant
9	Grape skin, 3 seeds	1 beetle, 2 ants
10	Grape skin, 1 seed and mountain ash berry	

Thinking that the Sage Thrashers' preference for sour tastes might extend to their insect diet, locusts and ants were tasted. A locust infusion had a delicate and suprisingly pleasant flavor but without a trace of sourness, while the ants had a flavor almost identical with that of castor oil.

The Thrashers taken on August 20 were in the midst of moult, while those taken on September 2 were nearly through moulting. A severe gale (sand storm) occurred on September 14. On September 15 small flocks of Thrashers were seen in roadside weed patches (an unusual place to find Thrashers), after which none were seen except one lone Thrasher seen in the vineyard two different days in November.

The Thrashers were assisted to some extent in their depredations on the early grapes by Bullock's Orioles. After the Thrashers had left for the south, Robins, while flocking preparatory to migrating, injured the very late grapes.

Sunnyside, Wash.

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[1] Nos. 6–10 killed Sept. 2, 6:30 A. M.

NOTES ON SOME SUMMER AND FALL BIRDS OF THE CROOKED LAKE REGION, CASS AND CROW WING COUNTIES, MINN.

BY ALBERT W. HONYWILL, JR.

The birds in the following list were observed during portions of four summers, spent at a camp on Crooked Lake, in what is known as the "Lake Region of Minnesota." The notes cover the following periods: from July 11 to September 8, 1907; July 11 to August 30, 1908; July 17 to August 30, 1909; and July 19 to August 30, 1910.

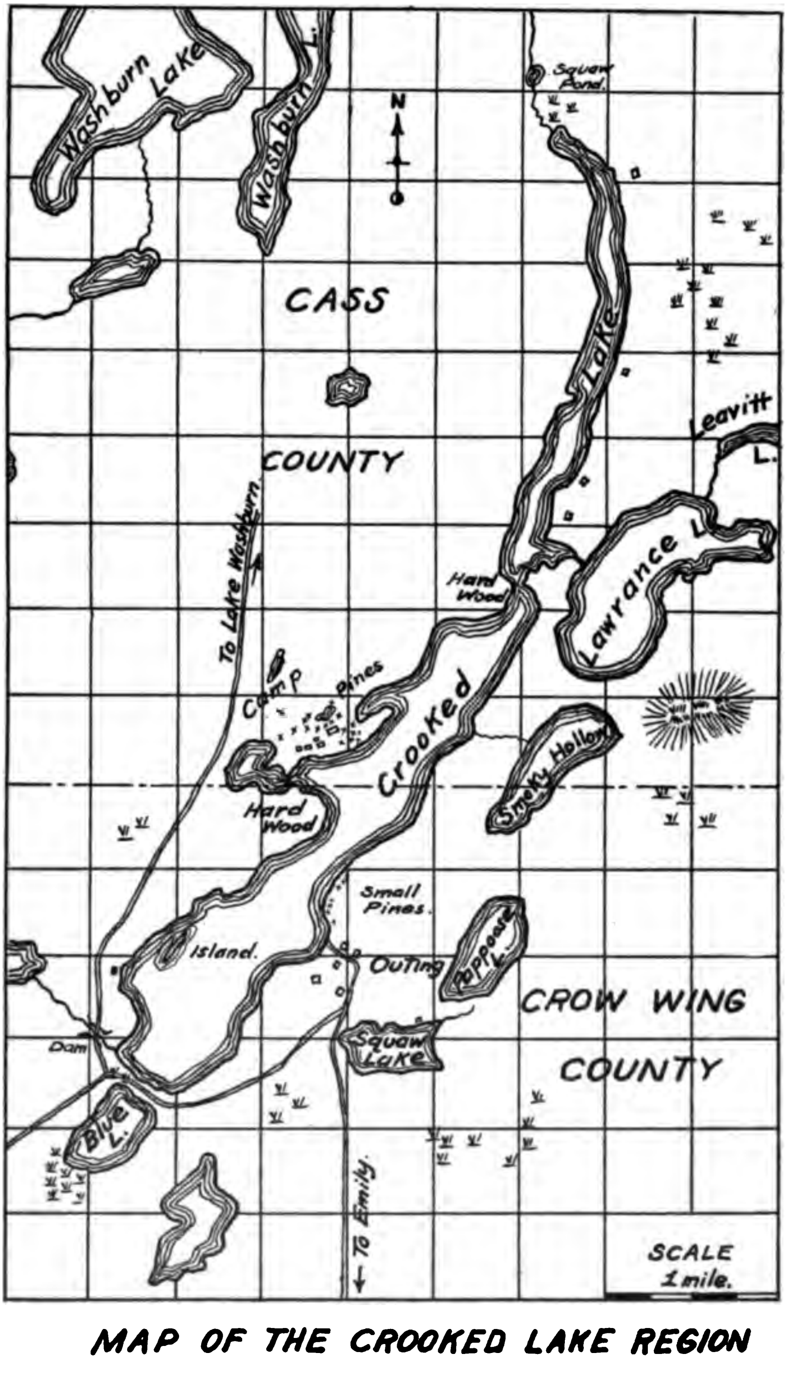
The list is not presented as a complete list of the summer birds of the region described, but it is hoped that some of the notes may prove of interest as covering an area whose avifauna has changed greatly in the last twenty-five years, and is likely to undergo still further change as it is settled and opened up to farming.

Many of the birds were observed while on fishing trips and during walks to Emily, a small town located about four miles south of Crooked Lake. A daily bird record was kept.

The region described contains a large number of lakes, many of which are of considerable size. Crooked Lake is a long narrow lake about six and a half miles in length. The upper half narrows down until it appears more like a wide river than a lake. Several other lakes empty into Crooked, the largest of which is known as Lawrence Lake, and is perhaps two miles long.

The land in this region was formerly covered with a thick growth of pine, largely Norway and white pine, but this was steadily cut off until about ten years ago, when the last tract of timber of any size was cut. Most of the land has since grown up to white birch, scrub oak, and poplar. Almost every fall portions of the country are burned over by forest fires, so that although in some places the timber was cut twenty-five years ago, there is no growth of any size save for an occasional patch of original hardwood forest.

The camp mentioned above is located near the shore, on a cove or bay on the west of Crooked Lake. A small grove of Norway pine, perhaps five acres in extent surrounds the camp. These



MAP OF THE CROOKED LAKE REGION

pines were purchased from the lumber interests a number of years ago, and are the only pines of any size in the vicinity. Across from the camp, on the other side of the cove, is a small hardwood forest containing many fine old birches. Directly west of the camp, for several miles, the country has grown up to brush.

Along the road from the little town of Outing, located on the east bank of Crooked Lake, to Emily, small portions of the land are under cultivation, and more is being cleared.

Nests containing eggs or young of the following species were found: Spotted Sandpiper, Chimney Swift, Kingbird, Phœbe, Goldfinch, Chipping Sparrow, Song Sparrow, Purple Martin, Cedar Waxwing, Catbird, House Wren, and Robin.

From my daily list I find that an average of about 17 species were seen each day, the greatest number being 35 seen on July 14, 1908.

Three birds have been omitted from the following list because their identification was considered too doubtful. It is hoped that at some future date further notes may be added.

I am much indebted to Mr. Herbert K. Job for examination of the manuscript, and for helpful suggestions in preparing the same.

List of Birds Observed.

1. **Podilymbus podiceps.** Pied-billed Grebe.— A single pair was seen in a small " pug hole," or slough, near Washburn Lake, on Aug. 19, 1907.

2. **Gavia immer.** Loon.— Abundant. Each small lake has its pair of birds. Their call is often heard in the early morning and late afternoon as they fly over singly or in pairs. By the middle of August, when the young are better able to take care of themselves, the Loons seem to prefer the larger lakes, perhaps because the food supply is better. I have sometimes seen as many as six Loons on Crooked Lake at one time.

3. **Hydrochelidon nigra surinamensis.** Black Tern.— These birds are commonly seen flying over Crooked and Blue Lakes. Flocks of twelve or fifteen will sometimes gather on a small island of rocks near the lower end of Crooked. These Terns seem to have become more abundant in the past year or two.

4. **Lophodytes cucullatus.** Hooded Merganser.— These birds appear to be not uncommon. I have seen them several times on small lakes west of Crooked, as well as on the latter and the small stream emptying from it.

5. **Anas platyrhynchos.** MALLARD.— Two or three pairs breed on Crooked Lake each year. They are not common here, however, because there is practically no wild rice. About twelve miles north of Crooked Lake Mallards are quite plentiful.

6. **Aix sponsa.** WOOD DUCK.— Several of these birds were usually observed each year on a small lake about a mile west of the camp.

7. **Botaurus lentiginosus.** BITTERN.— Common. I have several times flushed these birds by nearly stepping on them while walking along the lake shore. When out fishing I have rowed within a few feet of them only to have them take to the brush rather than fly.

8. **Ardea herodias herodias.** GREAT BLUE HERON.— Quite common. I was told by a former lumber camp cook that there was a colony of these birds on Pistol Lake, about eight miles west of Crooked Lake, but I was unable to verify this statement.

9. **Porzana carolina.** SORA.— Not common.

10. **Fulica americana.** COOT.— Uncommon. Seen on Crooked Lake Aug. 30, 1908.

11. **Gallinago delicata.** WILSON'S SNIPE.— Occasionally observed during fall migration. Seen on Aug. 25 and 29, 1908, and on Aug. 3, 1910.

12. **Helodromas solitarius solitarius.** SOLITARY SANDPIPER.— Not uncommon during the fall migration.

13. **Actitis macularius.** SPOTTED SANDPIPER.— A common bird along the lake shores. On July 22, 1909, a couple of young birds were caught and photographed on a small island at the lower end of Crooked Lake.

14. **Oxyechus vociferus.** KILLDEER.— On July 19, 1910, five birds were observed flying along the shore of Crooked Lake. At a small lake west of Crooked, on August 3, small flocks were observed running along the water's edge.

15. **Bonasa umbellus umbellus.** RUFFED GROUSE.— Common. Covies of these birds were often flushed. A cat from our camp caught a brooding bird on the nest, early in the season. The nest was located under a woodpile near the barn, and contained twelve eggs.

16. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Occasionally seen soaring overhead.

17. **Circus hudsonius.** MARSH HAWK.— Rather common. On July 27, 1910, I scared up a family of five from ground partly overgrown with brush.

18. **Accipiter velox.** SHARP-SHINNED HAWK.— Not common. A male of this species was shot in the chicken yard on Aug. 13, 1908.

19. **Accipiter cooperi.** COOPER'S HAWK.— Not common.

20. **Buteo borealis borealis.** RED-TAILED HAWK.— A hawk of this species was identified on August 5, 1910.

21. **Haliæetus leucocephalus leucocephalus.** BALD EAGLE.— This bird is fast disappearing from this region. Formerly it was not uncommon to see two or three of these magnificent birds in the air at the

same time, but this year (1910) not a single bird was seen. The gunners cannot resist the temptation to shoot at the bird because of its size and beauty. I heard of one bird which was shot this summer, which I assumed from the description was a young bird. It was left where it fell.

22. **Falco sparverius sparverius.** SPARROW HAWK.— Rather uncommon.

23. **Pandion haliaëtus carolinensis.** OSPREY.— Three nests were located in rather close proximity to each other on the top of dead stubs about a mile from the camp and half a mile from Crooked Lake.

24. **Bubo virginianus virginianus.** GREAT HORNED OWL.— It is not unusual to hear the distant hoot of this owl about dusk or in the early evening. During the summer of 1907 a pair of young birds made their headquarters in a small tamarack swamp a short distance from the camp. Before it was dark they would commence calling at regular intervals, continuing until late at night. Their harsh, discordant cries so disturbed the sleep of some of the members of the camp that, finally, one of the birds was shot and the other seared away.

25. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.

26. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— On August 18, 1908, I caught and photographed a young bird that was just about able to fly. Cuckoos appear to be fairly common in this vicinity. They are heard quite often, but it is almost impossible to get near enough to see them, and for this reason it is difficult to say whether this or the preceding species is the more common.

27. **Ceryle alcyon.** KINGFISHER.— Commonly seen along the lake shores.

28. **Dryobates villosus villosus.** HAIRY WOODPECKER.— Fairly common. Quite often seen about the camp.

29. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Common, but especially so during the last of August and September.

30. **Sphyrapicus varius varius.** YELLOW-BELLIED SAPSUCKER.— In 1907 a bird was seen on August 6. The next year Sapsuckers were quite common. On August 11, and for two or three days following, a bird was observed drumming on the tin gutter of one of the buildings. During 1909 no Sapsuckers were seen, while in 1910 the only bird observed was seen on August 24.

31. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER.— I have never seen this bird, but twice I have heard a call which a former "lumber jack," in charge of the camp during the year, ascribed to this species. He said that he occasionally saw these birds around the camp in the spring. The mummified remains of a male bird, shot this last spring, was shown to me.

32. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— Although never very common this bird seemed to be more rare than usual in 1910. Only two individuals were observed.

33. **Colaptes auratus luteus.** FLICKER.— Very common. This

country offers innumerable nesting sites in the enormous number of dead tree trunks that are standing.

34. **Antrostomus vociferus vociferus.** WHIP-POOR-WILL.— Nearly every night during July several Whip-poor-wills were heard calling in the distance, but after the middle of August they were only heard occasionally.

35. **Chordeiles virginianus virginianus.** NIGHTHAWK.— Abundant. In the day time I have found them squatted on the tops of stumps. During the afternoon and until dark they are commonly seen overhead. About the first of September thirty or forty migrating Nighthawks may be counted at one time. On July 24, 1907, while walking across a blueberry patch, I flushed two young birds, which succeeded in making their escape.

36. **Chætura pelagica.** CHIMNEY SWIFT.— Not very common. Several were observed about a mile beyond the end of Crooked Lake on July 31, 1907, when a nest containing four young birds was found in a deserted log cabin. I believe that the Swifts quite often nest in hollow stubs in this vicinity.

37. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.— Not more than two or three have been observed during an entire season.

38. **Tyrannus tyrannus.** KINGBIRD.— Abundant.

39. **Sayornis phœbe.** PHŒBE.— Quite common. There are two double-deck nests in the camp that have been occupied in successive years; one under the ridgepole of a log cabin, and the other on the window sill of a frame building. A third nest was located in the woodpile.

40. **Myiochanes virens.** WOOD PEWEE.— Very common in the vicinity of the camp, where there are several stretches of hard wood forest.

41. **Empidonax minimus.** LEAST FLYCATCHER.— Not as common as the Wood Pewee, but found in the same location.

42. **Cyanocitta cristata cristata.** BLUE JAY.— Common at all times, but more noticeable toward the end of August, when they commence to call.

43. **Corvus corax principalis.** NORTHERN RAVEN.— Occasionally seen near the lake shore, or soaring overhead.

44. **Corvus brachyrhynchos brachyrhynchos.** CROW.— Fairly common.

45. **Molothrus ater ater.** COWBIRD.— Not very common. A few seemed to remain near the camp.

46. **Agelaius phœniceus phœniceus.** RED-WINGED BLACKBIRD.— This bird is not as common in this region as one would be led to expect from the large amount of marshland and the great number of lakes.

47. **Sturnella magna magna.** MEADOWLARK.— Occasionally seen in the vicinity of Emily, about five miles south of Crooked Lake, where the land is more or less cultivated.

48. **Icterus galbula.** BALTIMORE ORIOLE.— On August 22, 1908, a bird was seen at a distance and identified as a female of this species. The identification, however, was not positive, and it may be that the Baltimore Oriole does not occur in this immediate vicinity.

49. **Quiscalus quiscula æneus.** BRONZED GRACKLE.— Rather uncommon during the summer, but small flocks are sometimes seen during the latter part of August.

50. **Carpodacus purpureus purpureus.** PURPLE FINCH.— Occasionally observed around the camp in the latter part of summer.

51. **Astragalinus tristis tristis.** GOLDFINCH.— Very abundant. A nest containing five eggs was found on August 23, 1910.

52. **Passer domesticus.** ENGLISH SPARROW.— First appeared in this immediate vicinity in spring of 1907. They attempted to take possession of the Martin houses, but several were shot and the rest scared off. Each year since then war has been waged upon them, and they have not as yet become troublesome.

53. **Pooecetes gramineus gramineus.** VESPER SPARROW.— Along the road to Emily, and wherever tracts of sufficient size have been cleared, or are not overgrown with brush, the Vesper Sparrow is quite common.

54. **Ammodramus savannarum australis.** GRASSHOPPER SPARROW.— It is not unusual to hear the song of this rather shy and unobtrusive bird, coming from the brush and fields along the road from Outing to Emily.

55. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— The song of this characteristic bird may be heard at almost any hour of the day.

56. **Spizella passerina passerina.** CHIPPING SPARROW.— Quite abundant, especially near the camp. Several nests were observed in the lower branches of the pines.

57. **Spizella pusilla pusilla.** FIELD SPARROW.— Common along the road to Emily, where there are several cultivated fields, but rare elsewhere.

58. **Melospiza melodia melodia.** SONG SPARROW.— Very common. A nest, located near the outlet of Crooked Lake, was situated in a bush, about six feet from the ground, and contained three eggs on July 24, 1910. Another nest was found in a bush overhanging the water and only about two feet from it.

59. **Pipilo erythrophthalmus erythrophthalmus.** TOWHEE.— Common in the brush, where their song is continually heard.

60. **Zamelodia ludoviciana.** ROSE-BREASTED GROSBEAK.— Not uncommon. A pair were seen July 28, 1907, and a female Aug. 21, 1910. They are occasionally observed on the drive into camp.

61. **Piranga erythromelas.** SCARLET TANAGER.— Rather uncommon.

62. **Progne subis subis.** PURPLE MARTIN.— Common. The farmers as a rule erect some kind of a nesting box and these are usually occupied. In three cases I have found Martins nesting in holes in dead trees, and I believe it is not an uncommon practise in this locality. In 1904 three Martin houses on the camp were each occupied by a single pair of birds. In 1905 there was no increase. By 1907 we had put up five houses of various kinds and four of these were in use by five pairs of birds. In 1908 there was a small increase in our flock. The next year two of the

first houses were replaced by new ones. There were perhaps twelve pairs of birds nesting about the camp, although the exact number could not be ascertained. This year another house was erected and a further increase of the flock noticed. A few days before they left this fall I was able to count over fifty birds, and without doubt there were more. Average date of departure, August 25. Latest seen August 29, 1908.

63. **Petrochelidon lunifrons lunifrons.** Cliff Swallow.— A few occasionally seen in the fall.

64. **Hirundo erythrogastra.** Barn Swallow.— Never seen in the immediate vicinity of Crooked Lake, but observed along the road to Pine River, where the country is more settled.

65. **Bombycilla cedrorum.** Cedar Waxwing.— Common. On Aug. 4, 1908, four young birds were found that were not quite able to fly. While arranging them to be photographed one of the old birds came and fed them. The old birds appeared to be fearless, and fed the young ones blueberries and wild cherries while I held them enclosed in my hands, and even tried to get to their young when I pushed them gently aside. Nests were sometimes located in the Norway pines, from the noise made by the young in calling for food. Usually these nests were placed upon the extreme ends of the branches and were inaccessible. They were generally composed almost entirely of usnea moss.

66. **Vireosylva olivacea.** Red-eyed Vireo.— Very common. From August 21 to 24, 1910, large numbers of migrants were seen.

67. **Mniotilta varia.** Black and White Warbler.— One was heard singing on Aug. 11, 1910. Migrants were fairly common on, and for a few days after, the twenty-first of the month.

68. **Vermivora rubricapilla rubricapilla.** Nashville Warbler.— A bird was seen in the second growth near the bank of a small lake on August 17, 1910, and was identified as belonging to this species.

69. **Dendroica æstiva æstiva.** Yellow Warbler.— Not uncommon along the borders of the lakes.

70. **Dendroica pensylvanica.** Chestnut-sided Warbler.— Rather rare summer resident; more common after the middle of August.

71. **Dendroica virens.** Black-throated Green Warbler.— I have never observed this bird in the pines around the camp, although I have heard the song on the drive into camp.

72. **Dendroica vigorsi.** Pine Warbler.— Quite often observed in the pines near the camp, where it probably breeds.

73. **Seiurus aurocapillus.** Ovenbird.— Common.

74. **Seiurus noveboracensis noveboracensis.** Water Thrush.— Quite common from August 24 to 27, 1910, when it was observed in the birch woods as well as along the water's edge.

75. **Geothlypis trichas trichas.** Maryland Yellow-throat.— Abundant.

76. **Wilsonia canadensis.** Canada Warbler.— Migrants were seen on August 21 and 24, 1910.

77. **Setophaga ruticilla.** REDSTART.— Rather rare summer resident. Migrants observed from August 19 to 24, 1910.

78. **Dumetella carolinensis.** CATBIRD.— Not very common. A pair nested near the camp but they were seldom seen in the brush.

79. **Toxostoma rufum.** BROWN THRASHER.— Not uncommon.

80. **Troglodytes aëdon aëdon.** HOUSE WREN.— Very common. One pair was found nesting in a rural delivery box, while a second pair selected an old threshing machine as a desirable location. Another pair nested within one of the camp buildings, gaining access through a crevice under the eaves.

81. **Sitta carolinensis carolinensis.** WHITE-BREASTED NUTHATCH. — Quite common.

82. **Penthestes atricapillus atricapillus.** CHICKADEE.— Common.

83. **Hylocichla mustelina.** WOOD THRUSH.— Occasionally seen, but more often heard, in the late afternoon or evening.

84. **Hylocichla fuscescens fuscescens.** VEERY.— During the summer of 1908 the Veery was quite often seen or heard in the vicinity of the camp, but all other years it has been more or less uncommon.

85. **Planesticus migratorius migratorius.** ROBIN.— Common about the camp.

86. **Sialia sialis sialis.** BLUEBIRD.— Fairly common. One or two broods usually remained near the camp.

THE BAHAMAN SPECIES OF *GEOTHLYPIS.*

BY W. E. CLYDE TODD.

Two very distinct Warblers of the genus *Geothlypis* exist in the Bahama Islands, one the common Maryland Yellow-throat of eastern North America, *G. trichas,* which occurs as a winter resident, the other a much larger endemic species, found in the more northern islands of the group, where it has become split up into a number of closely allied specific or conspecific forms, whose discrimination is a matter of no small difficulty. Our present concern is with this larger bird, this study being the outgrowth of an attempt to identify the specimens collected by Mr. W. W. Worthington in 1909, and having been made possible through the courtesy of the various institutions and individuals specified beyond, whereby I have been able to bring together no less than one hundred and fourteen specimens of this puzzling group, including the types of five of the described forms. The examination and comparison of this material, inadequate as it is in many respects, has nevertheless led to some interesting results which, differing somewhat as they do from previously published conclusions, are presented herewith as a contribution towards the solution of an intricate and perplexing problem.

The bird in question was discovered by Dr. Henry Bryant on the island of New Providence during his second visit to the Bahamas (in the winter of 1865–66), and was described from three male specimens under the name *Geothlypis rostratus*,[1] comparison being made with *G. trichas*. In 1872 Mr. Ridgway[2] reduced it to a subspecies of *G. trichas*, but it was subsequently raised again to specific rank by Mr. Cory[3] — a decision which has not been questioned since. Mr. Cory was apparently the second person to meet with the species, securing two specimens, one of which was a female, during December, 1878, and January, 1879. In 1886 Mr. Ridgway[4] described two allied forms, *G. coryi* from Eleuthera and *G. tanneri* from Abaco, based on specimens collected by the naturalists of the U. S. Fish Commission Steamer 'Albatross.' In 1892 Mr. Cory[5] recorded birds of this general type from New Providence, Andros, Great Bahama, Abaco, and Eleuthera, and suggested that *G. tanneri* ought to stand as a subspecies of *G. rostrata*, while at the same time insisting upon the specific distinctness of *G. coryi*. His remarks seem to have been based on an examination of the specimens in his own collection and in that of Mr. Charles J. Maynard, who has collected more examples of these skulking, retiring birds than any other person. Indeed, so far at least as New Providence is concerned, these birds, never abundant at any time, seem to have been so far reduced in numbers by Mr. Maynard's collecting (in 1897) that they have not yet recovered their lost ground; at any rate, no subsequent collectors have ever been able to find them in any numbers. Mr. Maynard's specimens were scattered, the greater part, however, going into the collections of Messrs. E. A. and O. Bangs and of Mr. G. S. Miller, Jr., the latter thence into the British Museum, being thus lost to ornithologists in this country.

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[1] Proc. Boston Soc. Nat. Hist., XI, 1867, 67.

[2] Am. Jour. Sci., IV, 1872, 458.

[3] Birds Bahama Islands, 1880, 73.

[4] Auk, III, 1886, 334, 338.

[5] Cat. West Indian Birds, 1892, 156.

Up to 1897, although meanwhile, as we have seen, certain of the other islands had been credited with what were considered representative insular forms, no one seems to have suspected the existence of *two* supposedly distinct species on New Providence› and "it is to Mr. Maynard's great acuteness as a collector that this unlooked for discovery is due." While collecting these birds that season he noticed that they had "two different songs, and making notes on the birds he shot, soon found that two distinct species were breeding equally commonly there. The smaller, duller colored bird, *G. rostrata*, sings like a Maryland Yellow-throat. The larger, more highly colored species, sings like *G. coryi*,— a song so different that Mr. Maynard says, no one on first hearing it would take it for the performance of a Yellow-throat."[1] Mr. Bangs accordingly described the latter form under the name *Geothlypis maynardi*, after its discoverer, pointing out its obvious distinctive characters as compared with *G. rostrata*. Thus matters rested until 1902, when Mr. Ridgway[2] described a second form from Abaco, *G. incompta*, one from Andros, *G. exigua*, and a *third* from New Providence. *G. flavida*, the latter having originally been recorded as a probably accidental occurrence of *G. coryi* by Mr. Bangs. Mr. Ridgway also discussed the case of these Bahaman forms at considerable length, and, while provisionally retaining them all as full species, he at the same time suggested that eventually they would have to stand as follows:

1. *Geothlypis rostrata.* New Providence.
2. *Geothlypis tanneri tanneri.* Abaco.
3. *Geothlypis tanneri maynardi.* New Providence..
4. *Geothlypis incompta incompta.* Abaco.
5. *Geothlypis incompta exigua.* Andros.
6. *Geothlypis coryi coryi.* Eleuthera.
7. *Geothlypus coryi flavida.* New Providence.

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[1] Bangs, Auk, XVII, 1900, 290.
[2] Birds N. and Mid. Am., II, 1902, 677, 678.

The latest authority to deal with the question is Mr. J. Lewis Bonhote,[1] who, apparently without having seen Mr. Ridgway's conclusions, challenges the status of *G. maynardi*, adducing arguments as well as *a priori* considerations tending to show that it represents merely the fully adult plumage of *G. rostrata*. Mr. Bonhote further records a dull-colored bird from Abaco which he refers doubtfully to *G. tanneri*, but he points out that if "*G. maynardi* and *G. rostrata* prove to be two good species, then the dull Abaco bird must be specifically distinct from *G. tanneri*, but could hardly be considered distinct from *G. rostrata*."

With this historical review of the subject as an introduction, let us now take up our series of specimens. Laying aside for the moment the (twenty-two) female and young birds and confining our attention to the adult males, we find the island of New Providence represented by forty-six specimens, with three exceptions all taken during the first six months of the year, and therefore in winter or nuptial plumage, as the case may be. Unlike *G. trichas*, there would seem to be no prenuptial moult, the nuptial plumage being acquired apparently by wear alone; at any rate, I can find no traces of such a moult in the present series. The lot of skins as they lie fall naturally into two series, the criteria for their separation being the intensity of the yellow below and the color of the flanks and tibiæ. One, with which the type of *G. rostrata* agrees, is paler yellow below, the abdomen decidedly duller and paler than the throat and breast, while the flanks are conspicuously "light buffy grayish brown" — a difficult color to name precisely, but sufficiently distinctive autoptically. The other lot, to which the type of *G. maynardi* belongs, is obviously deeper and brighter yellow below, almost as bright on the belly as anteriorly, while the flanks are greenish yellow. These differences stand out prominently when the two series are compared as such, and apparently are not influenced to any extent by wear. Turning the skins backs uppermost, corresponding differences are obvious between the respective series, although perhaps not so decided or constant as in the case of the under parts. In *G. rostrata* the back is duller olive green, the gray of the crown is purer, less greenish, and the

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[1] Ibis, 1903, 283–286.

"superciliaries"[1] are grayish white, sometimes very faintly tinged with pale yellowish behind the eyes. In *G. maynardi* the back is brighter olive green, the crown averages more greenish, and the superciliaries are more decidedly tinged with yellow. There is, however, considerable individual and seasonal variation in all these respects. Several specimens taken in May and June are in more or less worn breeding dress, and in these the gray of the crown (which is mainly superficial) is scarcely obvious, the color being dull greenish. The type of *G. flavida* I have not seen, but the only other specimen referred to this form by Mr. Ridgway (No. 3376, Bangs Collection), now before me, I should judge to be merely a worn example of *G. maynardi*. At any rate, it certainly agrees very closely, allowing for its more worn and faded condition, with a skin of *G. maynardi* (No. 189826, U. S. National Museum) dated June 18. Additional corroborative evidence on this question is afforded by a study of the effect of wear in the case of *G. beldingi*,[2] a species closely allied to the Bahaman bird, although widely separated therefrom geographically. In this species there is a decided difference between birds in winter and in worn breeding plumage. Many individuals in the latter dress have no vestige of brown (corresponding to the gray of the Bahaman species) on the crown and occiput, while the post-facial band is wider, and brighter yellow, passing into yellowish green posteriorly, giving a much brighter general effect. The changes due to wear in this species, therefore, are evidently precisely analogous to those in the Bahaman bird which have led to the separation of the so-called *G. flavida*. Under such circumstances I think that there can be no doubt as to the propriety of dropping the latter from further consideration.

Measurements of the two supposed New Providence forms, as per the subjoined tables, and indicated by Mr. Bangs, show a small average difference in the wings, and tail, *G. maynardi* being slightly the larger in these respects. In the case of the females the color-differences exhibited are much more striking than in the males, although of a parallel kind. The female of *G. rostrata* is dull yellow — nearly straw yellow — below, fading to dull white on the abdomen, the sides and flanks shaded with pale grayish or buffy olive — all with an obsoletely streaked appearance, the general effect being much as in some immature specimens of *Dendroica striata*, except for the dull yellow under tail-coverts. The female of *G. maynardi*, on the other hand, is much brighter yellow below, the belly paler, more buffy, the sides and flanks darker, the general resemblance to the same sex of *G. beldingi* being quite close. It was a bird of this type that was described by Mr. Cory as the female of *G. rostrata*, his original specimen being now before me.

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[1] *I. e.*, the line along the upper margin of the black "mask," from above the eye to the nape.

[2] I am indebted to Mr. William Brewster and Mr. John E. Thayer for the loan of their respective series of this species, which, taken in connection with the material in the Carnegie Museum, has furnished an ample basis for study.

Bearing in mind the nature of the variations exhibited by the series from New Providence, let us now take up the birds from the northernmost islands, Abaco, Little Abaco, and Great Bahama, which, together with their outlying cays, are represented by a series of thirty-eight specimens, of which seven are adult females, one a female in juvenal dress, and one a young male in postjuvenal moult. The Abaco bird was first described by Mr. Ridgway, as aforesaid, under the name *Geothlypis tanneri*, and with the type specimens all the skins but twelve agree — three from Great Bahama, two from Little Abaco, and seven from Abaco. These twelve skins are obviously referable to Mr. Ridgway's *G. incompta*, the type of which was one of the four specimens listed under the original description of *G. tanneri*. Taking up the specimens representing this latter species first, we find that they differ from *G. maynardi* in the following particulars: (1) the general olive color of the upper parts has a brownish cast, quite evident when the two series lie side by side; (2) the gray of the crown is less obvious, and sometimes replaced by greenish olive or brownish (the same shade as in *G. beldingi*), while the paler anterior margin is scarcely or not indicated; (3) the superciliaries are decidedly yellow, passing into white posteriorly; (4) the yellow below averages deeper, while the flanks are washed with brownish yellow. The size, however, is the same as in *G. maynardi*. I am unable to point out any constant differences between the females of *G. maynardi* and *G. tanneri*; the latter, however, seem to average a little more richly colored below.

Geothlypis incompta, however, may be readily distinguished from *G. tanneri*, differing (1) in its slightly smaller size; (2) in its duller coloration above, the crown and back being less strongly contrasted; (3) in its much paler superciliaries, which are whitish or yellowish white; (4) in the yellow below being decidedly duller, especially on the abdomen; (5) in the color of the flanks, which are light buffy grayish brown, exactly as in *G. rostrata*.

We are now prepared to consider our series from Andros Island, consisting of nine specimens, all but one males. Although so few in number, two distinct types are represented, corresponding to those inhabiting both New Providence and the northern islands. Although the type specimen of *G. exigua* is unfortunately not available, the description indicates a dull-colored bird of the *rostrata-incompta* group, but with a shorter wing and smaller and more slender bill. In view of the range of variation exhibited in the measurements of the other forms, I am not inclined to attach any great significance to these differences, even though a larger series prove their constancy, as they are at most very slight and in my judgment unworthy of nomenclatural recognition. In fact, after a very careful comparison I find myself quite unable to distinguish three of the Andros birds (Nos. 39531–39533, Field Museum Collection) from *G. rostrata*, and should refer them to that form without hesitation. The other five male examples, which are all of the bright-colored type, are not so easily allocated, but on the whole seem best referred to *G. maynardi*, although the superciliaries have rather more yellow than the average of that form. The single female bird is also best placed here.

One other form, *Geothlypis coryi*, from Eleuthera Island, remains to be considered. Besides the type, nine specimens are available, including two females. This form seems sufficiently distinct at first glance to stand as a full species. It is characterized by its bright coloration, the olive green of the upper parts being much brighter than in any of the other forms, and the crown shows scarcely a trace of gray, being almost as green as the back — even more so in worn plumage — while the superciliaries are almost wholly bright yellow, with only a trace of white along the upper margin of the black auricular patch. The post-frontal band also is yellowish, but is not very distinctly indicated. Below, the yellow is as rich as in *G. maynardi*, and the flanks similarly colored. In all these characters the present form is approached by some specimens of the *maynardi-tanneri* type, to which it is obviously allied. The female, too, is more richly colored than in the other forms, being much brighter olive (as bright as the male) above, and brighter and more extensively yellow below, while the superciliaries are distinctly yellow. The alleged differences in proportions, and in the width of the black frontal band, seem inconsequential upon comparison.

It appears, therefore, that on every island except Eleuthera where the large Yellow-throats occur two styles of bird are found, one of duller, the other of brighter, colors. What relation do these two types bear to each other, and to their respective inter-island variants? Are the five forms which are susceptible of definition full species, geographical variations of one or more specific types, or different plumages of such subspecies? Obviously the two forms from any one island cannot be regarded as conspecific without violating the definition of a subspecies as a "geographic race," inasmuch as both occur together in an unusually restricted area. We have seen that *G. rostrata* and *G. incompta* on the one hand, and *G. maynardi*, *G. tanneri*, and *G. coryi* on the other, represent respectively the dull and the bright birds on the various islands. We might therefore be justified in arranging the forms as follows:

1. *Geothlypis rostrata rostrata.* New Providence, Andros.
2. *Geothlypis rostrata incompta.* Abaco, Great Bahama, etc.
3. *Geothlypis tanneri maynardi.* New Providence, Andros.
4. *Geothlypis tanneri tanneri.* Abaco, Great Bahama, etc.
5. *Geothlypis tanneri coryi.* Eleuthera.

So far as the actual characters of the forms go such an arrangement is natural enough, but there still remains the question why two so closely related specific types should thus occur together, occupying the same habitat, and still preserve their distinctive characters. Would not such an association of the two forms constantly tend to interbreeding between them to a greater or less extent, resulting ultimately in but one form? Mr. Bonhote, in the paper before referred to, presents the question thus: "Supposing that they reached the island [of New Providence] as two separate forms, they would be bound to approximate and merge together; or supposing, which is almost certainly the case, that they arrived on the island as *one* species, in what manner could natural selection so act as to produce two distinct species on one small rocky island, without hills, rivers, or any pronounced geographical features?"

The point here raised has been quite fully discussed by Prof. Dean C. Worcester in his paper on the distribution of Philippine birds.[1] Prof. Worcester doubts (from negative evidence) if two closely allied species would fuse under such circumstances, but thinks that either they would both continue to exist, or one would exterminate the other. Instances of such coincident distribution are not so numerous, however, as to allay the suspicion that we may not be dealing here with a case of this kind. Mr. Bonhote has advanced the theory that the observed differences are due entirely to *age*, the duller-colored individuals being birds in first nuptial plumage, while the brighter ones, are in second or later nuptial plumage, basing his arguments mainly on a specimen in his collection apparently showing the transition. Through Mr. Bonhote's courtesy this specimen, No. 728 of his collection, is now before me. It is an individual just completing (September 9) the postnuptial moult, retaining only the feathers of the flanks and tibiæ, which in color differ little from those of *G. rostrata*. Otherwise this specimen is typical of *G. maynardi*, being unusually richly colored below, owing of course to its fresh condition.

I should not be disposed to accept Mr. Bonhote's conclusions on the evidence of a single specimen of somewhat dubious character, especially in view of the fact that his theory finds no support by analogy when certain other species of this genus are examined, but there are other considerations not to be overlooked. The series of these birds which I have studied shows that in the dull-colored examples the plumage, particularly the remiges and rectrices, is more worn and faded than in bright-colored individuals taken at the same season. This is especially marked in the specimens from Abaco and Great Bahama, and fully accounts for the average difference in wing and tail measurements between the two series. Such a condition is precisely what obtains in the case of many species whose first nuptial plumage is merely the first winter plumage plus wear, to which the feathers of this stage are less resistant. While it is quite true that adults and young of *Geothlypis trichas* are indistinguishable in nuptial plumage by color characters, it is unsafe to assume that the same condition holds in the Bahama species, inasmuch as it is now known that allied species may moult quite differently. As previously noted, there seems to be no prenuptial moult in the Bahaman species, while a specimen (No. 14988, Bangs Collection, Little Abaco, July 11, 1904) in postjuvenal moult is assuming the black "mask," also the dull-colored plumage of the posterior under parts supposed to be characteristic (in this case) of *G. incompta*. Moreover, an "adult" specimen of *G. rostrata* (No. 30638, Collection Carnegie Museum, Blue Hills, New Providence, January 6, 1909), seems to have an elastic soft spot in the skull, indicating immaturity. Unless specimens showing a moult from the juvenal plumage directly into a bird of the bright-colored style are forthcoming, therefore, we are fully justified, I think, in accepting the explanation advanced by Mr. Bonhote, which covers all the facts in the case except the matter of the alleged difference in song. Regarding this point further field observations are desirable, but it is very likely, as Mr. Bonhote suggests, that age might be responsible for this also. However, it is significant that Mr. Riley states that a "specimen of *tanneri* [the Abaco representative of *maynardi*] taken was singing a song somewhat resembling the well-known notes of *G. trichas*, but probably with more force."

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[1] Proc. U. S. Nat. Mus., XX, 1898, 600–617.

As might be expected, the immature birds are less numerous than the adults, and the small series of Eleuthera skins which I have examined does not happen to contain any.

Although the three forms which appear worthy of recognition are not known actually to intergrade, it seems best to regard them as insular forms of one specific type, *Geothlypis rostrata* Bryant. The distinctive characters of the adult males are as follows:

Crown decidedly grayish; superciliaries faintly yellow-tinged; back dull olive green; flanks greenish yellow. (New Providence, Andros.) *Geothlypis rostrata rostrata.*

Crown more greenish (only superficially grayish); superciliaries decidedly yellow in front; back brownish olive green; flanks brownish olive yellow. (Abaco, Great Bahama, etc.) *Geothlypis rostrata tanneri.*

Crown decidedly yellowish green; superciliaries bright yellow; back bright olive green; flanks greenish yellow. (Eleuthera.) *Geothlypis rostrata coryi.*

The problem, thus reduced to its lowest terms, is seen to be quite simple. The confusion heretofore obtaining has been largely due, it will have been observed, to an imperfect understanding of the sequence of plumages involved, occasioned by lack of material. While there is still much to be desired in this respect, I venture to predict that the conclusions announced will not be unfavorably affected by future observations. In this connection I would suggest that *Geothlypis rostrata* is perhaps the descendant of a form which came originally from southern Mexico by way of Yucatan, being most nearly related to the group of Mexican species which comprises *G. flavovelata*,[1] *G. chapalensis*, and *G. beldingi*, rather than to *G. trichas*.

In order to completely clear up the confusion in the present group it seems desirable to cite the references, which are accordingly given herewith, together with a list of the specimens examined. In order to indicate the average difference in measurements that exist the dull (immature) and bright (adult) birds are separately grouped. The respective collections to which the specimens belong are designated by small index figures, as follows: [1]U. S. National Museum; [2]Bangs Collection (now in the Museum of Comparative Zoölogy); [3]Carnegie Museum; [4]Field Museum; [5]American Museum; [6]Brewster Collection; [7]Columbia University; [8]Bonhote Collection. This material comprises very nearly all the specimens now in America.

Geothlypis rostrata rostrata *Bryant.*

Geothlypis rostratus BRYANT, Proc. Boston Soc. Nat. Hist., XI, 1867, 67 (Nassau, New Providence; type now in collection U. S. National Museum; food).— CORY, Birds Bahama Is., 1880, 73, 226 (New Providence; descr.; crit.; habits).— CORY, List Birds W. Indies, 1885, 9 (New Providence).— RIDGWAY, Auk, III, 1886, 335, in text (crit.).— CORY, Cat. W. Indian Birds, 1892, 156 (New Providence and Andros; crit.).— BONHOTE, Ibis, 1899, 510 (New Providence; habits; crit.).

Trichas rostrata GRAY, Hand-List, I, 1869, 242.

Geothlypis trichas var. *rostrata* RIDGWAY, Am. Journ. Sci., IV, 1872, 458 (New Providence; diag.).— RIDGWAY, in Baird, Brewer and Ridgway, Hist. N. Am. Birds, I, 1874, 296 (New Providence; diag.).

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[1] *G. flaviceps* is now admitted by its describer, Mr. E. W. Nelson, to have been based on individual variation in *G. flavovelata*.

Geothlypis rostrata SHARPE, Cat. Birds Brit. Mus., X, 1885, 355 (reprint Cory's descr.).— CORY, Auk, III, 1886, 43 (reprint previous descr.).— RIDGWAY, Man. N. Am. Birds, 1887, 524 (diagnosis).— CORY, Birds W. Indies, 1889, 57 (reprint previous descr.).— CHAPMAN, Am. Nat., XXV, 1891, 533, 535 (relationship).— NORTHROP, Auk, VIII, 1891, 68 (Andros). — RIDGWAY, Auk, VIII, 1891, 335 (New Providence).— CORY, Cat. W. Indian Birds, 1892, 18, 119, 127 (New Providence and Andros).— PALMER, Auk, XVII, 1900, 217 (characters).— BANGS, Auk, XVII, 1900, 290, 291 (crit.; descr.; meas.; habits).— RIDGWAY, Birds N. and Mid. Am., II, 1902, 656 (crit.), 674 (descr.; syn.).— BONHOTE, Avic. Mag., VIII, 1902, 287 (New Providence; habits).— MAYNARD, Cat. Birds W. Indies, 1903, 26 (New Providence).— BONHOTE, Ibis, 1903, 283, (New Providence; crit.).— RILEY, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (New Providence; probable origin).— SHARPE, Hand-List, V, 1909, 115.

Geothlypis coryi (not of Ridgway) BANGS, Auk, XVII, 1900, 290, in text, 291 (Nassau, New Providence; crit.).— DUBOIS, Syst. Av., I, 1902, 437.— (?) RILEY, in Shattuck, The Bahama Islands, 1905, 367, part (Andros).

Geothlypis maynardi BANGS, Auk, XVII, 1900, 290 (Nassau, New Providence; type now in collection Museum Comp. Zoölogy; meas.; habits; crit.).— RIDGWAY, Birds N. and Mid. Am., II, 1902, 656 (crit.), 676 (descr.; syn.).— MAYNARD, Cat. Birds W. Indies, Second Appendix, 1903, 39 (New Providence).— BONHOTE, Ibis, 1903, 283, 284, 286, in text (New Providence; habits; crit.).— RILEY, Auk, XXII, 1905, 358 (New Providence; crit.).— RILEY, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (New Providence; probable origin).— SHARPE, Hand-List, V, 1909, 115.

Geothlypis tanneri maynardi RIDGWAY, Birds N. and Mid. Am., II, 1902, 657 (crit.).

Geothlypis exigua RIDGWAY, Birds N. and Mid. Am., II, 1902, 657 (crit.), 677 (Fresh Creek, Andros; type now in collection British Museum). — MAYNARD, Cat. Birds W. Indies, Second Appendix, 1903, 39 (Andros). — RILEY, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (Andros; probable origin).— SHARPE, Hand-List, V, 1909, 115.

Geothlypis incompta exigua RIDGWAY, Birds N. and Mid. Am., II, 1902, 657 (crit.).

Geothlypis flavida RIDGWAY, Birds N. and Mid. Am., II, 1902, 656 (crit.), 678 (Nassau, New Providence; type now in collection British Museum).— MAYNARD, Cat. Birds W. Indies, Second Appendix, 1903, 39 (New Providence).— RILEY, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (New Providence; probable origin).— SHARPE, Hand-List, V, 1909, 115.

Geothlypis coryi flavida RIDGWAY, Birds N. and Mid. Am., II, 1902, 657 (crit.).

List of Specimens.

No.	Sex.	Locality.	Date.	Wing.	Tail.	Exp. Cul.	Tar.
54923[1]	♂ im.	Nassau, N. P. (Type)		63	58	16	23.5
109939[1]	♂ im.	Nassau, N. P.	May 30, 1884	62	56	16.5	23
3377[2]	♂ im.	" "	" 14, 1897	61	56	16	22
3378[2]	♂ im.	" "	Mar. 3, "	63	60	16	22
3379[2]	♂ im.	" "	" 9, "	62.5	59	17.5	21.5
3380[2]	♂ im.	" "	June 27, "	61	57	15	22.5
3381[2]	♂ im.	" "	Mar. 6, "	65	60	16.5	22
3382[2]	♂ im.	" "	May 13, "	61	58	16	21.5
3383[2]	♂ im.	" "	Mar. 10, "	62.5	59	16.5	22
3384[2]	♂ im.	" "	Feb. 6, "	62.5	57.5	15.5	22
3385[2]	♂ im.	" "	" 25, "	63.5	58	16.5	21
3386[2]	♂ im.	" "	Mar. 25, "	62.5	57	16.5	22
30638[3]	♂ im.	Blue Hills, N. P.	Jan. 6, 1909	61	56.5	17	23
39531[4]	♂ im.	Andros	Nov. 25,1887	60	55	15.5	22
39532[4]	♂ im.	"	Dec. 5, "	58	54	15	21
39533[4]	♂ im.	"	" —, "	59	54	16	22.5
39534[4]	♂ im.	Nassau, N. P.	Jan. 27, 1884	62.5	59	16	22
39535[4]	♂ im.	" "	Feb. 2, "	64	58	17	22
39536[4]	♂ im.	" "	Jan. 29, "	63	59	16.5	23
1388[5]	♂ im.	" "	Apr. 19, 1902	63	59	16	23
108211[1]	♀ im.	New Providence	Mar. 19, 1886	59	59	15	22
3375[2]	♀ im.	Nassau, N. P.	Feb. 13, 1897	58.5	58.5	15.5	22
39537[4]	♀ im.	" "	" 20, 1884	58	58	15.5	21
189826[1]	♂ ad.	New Providence	June 18, 1903	67.5	61	16	22
3362[2]	♂ ad.	Nassau, N. P.	May 11, 1897	66	56	16	22
3363[2]	♂ ad.	" " (Type of *G. maynardi*)	" " "	66	62	16	22
3364[2]	♂ ad.	Nassau, N. P.	Feb. 8, "	65	61	16.5	22.5
3365[2]	♂ ad.	" "	" 12, "	66	60	16.5	22
3366[2]	♂ ad.	" "	Apr. 3, "	66	60	16	23
3367[2]	♂ ad.	" "	May 14, "	67	61	16	22
3368[2]	♂ ad.	" "	June 16, "	64	59	16.5	23
3369[2]	♂ ad.	" "	May 24, "	63	60	16	21.5
3370[2]	♂ ad.	" "	Mar. 4, "	62	58	17	23
3371[2]	♂ ad.	" "	June 24, "	67	55	16	22.5
3372[2]	♂ ad.	" "	May 11, "	64	59	16	21
3373[2]	♂ ad.	" "	" " "	65	60	16	21
3374[2]	♂ ad.	" "	June 22, "	59	58	16.5	22

List of Specimens. (*Continued.*)

No.	Sex.	Locality.	Date.	Wing.	Tail.	Exp. Cul.	Tar.
3376[2]	♂ ad.	Nassau, N. P.	July 7, 1897	65.5	59	15.5	23
30599[3]	♂ ad.	Blue Hills, N. P.	Jan. 1, 1909	64	57	17	22
30735[3]	♂ ad.	" " "	" 19, "	65	61	16	22
31024[3]	♂ ad.	Staniard Creek, Andros	Apr. 17, "	62	55	15	23
39555[4]	♂ ad.	"Bahama Islands"	Feb. —, 1884	68	59	15.5	23
39556[4]	♂ ad.	Nassau, N. P.	" 28, "	67	59	16	23
39557[4]	♂ ad.	" "	Jan 28, "	66.5	56	17	22.5
39558[4]	♂ ad.	" "	Apr. 8, "	68.5	60	15.5	22.5
39560[4]	♂ ad.	" "	Mar. 11, "	69	62	16	24
39562[4]	♂ ad.	" "	May 27, "	66	60	17	22
39564[4]	♂ ad.	" "	——— — "	64	56	15	22.5
39566[4]	♂ ad.	" "	May 15, 1887	66		16	22.5
39567[4]	♂ ad.	" "	Dec. 28, 1878	67	57	17.5	23
39569[4]	♂ ad.	Andros	Apr. 24, 1884	65	59	15	22
39570[4]	♂ ad.	"	" " "	65	61	15.5	23
39572[4]	♂ ad.	"	Nov. 25, 1887	60	56	15	22
39887[5]	♂ ad.	Nassau, N. P.	May 10, 1884	66	62	17	22.5
13140[6]	♂ ad.	" "	Feb. 21, "	67	59	16	22
258[7]	♂ ad.	Nicol's Town, Andros	Mar. 21, 1890	62	60	15	23
1283[8]	♂ ad.	Nassau, N. P.	Mar. 3, 1902	65	61	16	23
728[8]	♂ ad.	" "	Sept. 10, 1898	61	58	15	22
109938[1]	♀ ad.	" "	Feb. 27, 1884	62	56		22
39559[4]	♀ ad.	" "	" 4, "	67	58	14.5	21
39561[4]	♀ ad.	" "	Jan. 30, 1884	60	57	15.5	22
39563[4]	♀ ad.	" "	Feb. 12, "	64	56	15	23
39565[4]	♀ ad.	" "	Jan. —, "	61	55	16	23
39568[4]	♀ ad.	" "	" 25, 1879	63	59	15.5	22
39571[4]	♀ ad.	Andros	Dec. 4, 1887	62	55	15.5	22
13141[6]	♀ ad.	Nassau, N. P.	Feb. 27, 1884	63	59	16	22

Geothlypis rostrata tanneri *Ridgway.*

Geothlypis tanneri Ridgway, Auk, III, 1886, 335 (Abaco; type, whose number should be corrected to 108493, in collection U. S. National Museum).— Ridgway, Man. N. Am. Birds, 1887, 525 (diagnosis).— Jennings, Johns Hopkins University Circulars, VII, No. 63, 1888, 39 (Joe's Cay, Little Abaco).— Cory, Auk, V, 1888, 157.— Cory, Birds W. Indies, 1889, 287 (Abaco; reprint orig. descr.).— Cory, Birds Bahama Is., ed. 2, 1890, inserted page (Abaco; reprint orig. descr.).— Cory, Auk, VIII, 1891, 298 (Abaco).— Ridgway, Auk, VIII, 1891, 334 (Abaco).— Cory, Cat.

W. Indian Birds, 1892, 156, in text (Abaco and Great Bahama; crit.).— Palmer, Auk, XVII, 1900, 217 (characters).— Bangs, Auk, XVII, 1900, 290, in text.— Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.), 676 (Abaco, Great Bahama ?; descr.; syn.).— Bonhote, Ibis, 1903, 285 (Little Abaco; crit.).— Maynard, Cat. Birds W. Indies, 1903, 27 (Abaco). — Allen, (G. M.), Auk, XXII, 1905, 131 (Great Bahama, Moraine Cay, Abaco, Elbow Cay; habits).— Riley, Auk, XXII, 1905, 358, 359, in text (Abaco; habits).— Riley, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (Abaco, Little Abaco ?, Great Bahama ?; probable origin). — Sharpe, Hand-List, V, 1909, 115.

Geothlypis tannerii Chapman, Am. Nat., XXV, 1891, 533, 535 (relationship).

Geothlypis rostratus tanneri Cory, Auk, VIII, 1891, 350 (Great Bahama).

Geothlypis rostrata tanneri Cory, Cat. W. Indian Birds, 1892, 18, 119, 127 (Abaco, Great Bahama).

Geothlypis rostrata var. *tanneri* Dubois, Syst. Av., I, 1902, 437.

Geothlypis tanneri tanneri Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.).

Geothlypis tanner (lapsus) Allen (G. M.), Auk, XXII, 1905, 133 (cays off Abaco, etc.).

Geothlypis incompta Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.), 677 (Abaco; type in U. S. National Museum).— Maynard, Cat. Birds W. Indies, Second Appendix, 1903, 39 (Abaco).— Allen (G. M.), Auk, XXII, 1905, 131 (crit.).— Riley, Auk, XXII, 1905, 359 (Abaco; habits).— Riley, in Shattuck, The Bahama Islands, 1905, 354, 356, 367 (Abaco; probable origin).— Sharpe, Hand-List, V, 1909, 15.

Geothlypis incompta incompta Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.).

List of Specimens.

No.	Sex.	Locality.	Date.	Wing.	Tail.	Exp. Cul.	Tar.
108493[1]	♂ ad.	Abaco (Type)	Apr. 3, 1886	67	61	15.5	22.5
189827[1]	♂ ad.	"	July 22, 1903	62	58	16	21.5
14985[2]	♂ ad.	Moraine Cay	" 13, 1904	66	63	15.5	21
14986[2]	♂ ad.	Great Bahama	" 17, "	65	59	15	22
31030[3]	♂ ad.	Sand Bank, Abaco	Apr. 24, 1909	61	59	16	22
31086[3]	♂ ad.	" " "	" 29, "	65	62	16	21
31107[3]	♂ ad.	Spencer's Pt., Aba.	May 4, "	61	59	16	22
31108[3]	♂ ad.	" " "	" " "	63	61	16.5	22
31121[3]	♂ ad.	" " "	" 5, "	64	59	16	22
31138[4]	♂ ad.	" " "	" 6, "	64	60	16	21
39543[4]	♂ ad.	Great Bahama	June 23, 1891	60	60	16	22

List of Specimens. (*Continued.*)

No.	Sex	Locality.	Date.	Wing.	Tail.	Exp. Cul.	Tar.
39544[4]	♂ ad.	Great Bahama	June 24, 1891	58 ?	54	16	22
39545[4]	♂ ad.	" "	" 23, "	63	59	15	22
39546[4]	♂ ad.	" "	" 24, "	63	59	16.5	22
39548[4]	♂ ad.	" "	" 29, "	62	57	16	22
39550[4]	♂ ad.	" "	Dec. 22, "	61	56	15.5	23
39553[4]	♂ ad.	" "	" 23, "	63	58.5	15	22.5
39554[4]	♂ ad.	Abaco	Mar. " "	62	60	16	21.5
1349[5]	♂ ad.	Little Abaco	" 28. 1902	64	58	15 5	22
108496[1]	♀ ad.	Abaco	Apr. 3, 1886	59	56	15	22
14987[2]	♀ ad.	Great Bahama	July 17, 1904	59	54	16	22
39547[4]	♀ ad.	" "	June 23, 1891	55	51	15	21
39549[4]	♀ ad.	" "	" 29, "	54	55	15	23
39551[4]	♀ ad.	" "	Jan. 18, 1892	56	53	15	22
39552[4]	♀ ad.	" "	Dec. 23, 1891	57	56	15	21
1359[5]	♀ ad.	Little Abaco	Mar. 30, 1902	60	57	15	—
14988[2]	♂ juv.	" "	July 11, 1904	62	57	15	22
108494[1]	♂ im.	Abaco	Mar. 27, 1886	62	58	16	22
108495[1]	♂ im.	" (Type of *G. incompta*	Apr. 6, "	61	54	15.5	22
189758[1]	♂ im.	"	July 22, 1903	60	56		22
31059[3]	♂ im.	Sand Bank, Abaco	Apr. 27, 1909	61	60	16.5	22
31120[3]	♂ im.	" " "	May 5, "	62	61	16	21
39538[4]	♂ im.	Abaco	June 15, 1891	59	55	16	23
39539[4]	♂ im.	"	" 13, "	62	55	14	22
39540[4]	♀ juv.	Great Bahama	" 24, "	56	55	14	22
39541[4]	♂ im.	" "	" 29, "	52	54		22
39542[4]	♂ im.	" "	Jan. 8, 1892	61	59	15	21.5
1313[5]	♂ im.	Little Abaco	Mar. 22, 1902	61	59	15.5	22

Geothlypis rostrata coryi *Ridgway.*

Geothlypis coryi RIDGWAY, Auk, III, 1886, 334 (Eleuthera: type in collection U. S. National Museum; crit.).— RIDGWAY, Man. N. Am. Birds, 1887, 525 (diagnosis).— CORY, Auk, V, 1888, 157.— CORY, Birds W. Indies, 1889, 287 (reprint orig. descr.).— CORY, Birds Bahama Is., ed. 2, 1890, inserted page (reprint orig. descr.).— CHAPMAN, Am. Nat., XXV, 1891, 533, 535 (relationship).— RIDGWAY, Auk, VIII, 1891, 336 (Eleuthera).— CORY, Auk, VIII, 1891, 351 (Eleuthera).— CORY, Cat. W. Indian Birds, 1892, 18, 119, 126, 127, 156 (Eleuthera; crit.).— PALMER, Auk, XVII, 1900, 217 (characters).— Bangs, Auk, XVII, 1900, 290, in text (song).— Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.), 677 (descr.; syn.).— Maynard, Cat. Birds W. Indies, 1903, 26 (Eleuthera).— Riley, in Shattuck, The Bahama Islands, 1905, 354, 356, 367, part (Eleuthera; probable origin).— Sharpe, Hand-List, V, 1909, 115.

Geothlypis coryi coryi Ridgway, Birds N. and Mid. Am., II, 1902, 657 (crit.).

Geothlypis rostrata var. *coryi* Dubois, Syst. Av., I, 1902, 437.

List of Specimens.

No.	Sex.	Locality.	Date.	Wing.	Tail.	Exp. Cul.	Tar.
107876[1]	♂ ad.	Eleuthera (Type)	Mar. 12, 1886	65	59	16	22.5
107877[1]	♂ ad.	"	" " "	60	59	16.5	22.5
39524[4]	♂ ad.	" (S. dist.)	Nov. 16, 1891	64	57		22.5
39525[4]	♂ ad.	" (N. dist.)	" 17, "	64	60	16	22
39526[4]	♂ ad.	" (N. E. Pt.)	" 23, "	65	58	16	22
39528[4]	♂ ad.	" (moulting)	July 15, "	63	56	15	21.5
39529[4]	♂ ad.	"	" " "		61	16	22
39530[4]	♂ ad.	"	" 16, "	63	58	15	
107875[1]	♀ ad.	"	Mar. 13, 1886	61.5	57	15.5	22.5
39527[4]	♀ ad.	" (moulting)	July 15, 1891	55	57	15.5	22

In conclusion the writer wishes to acknowledge his indebtedness to the authorities of the various institutions specified previously, also to Messrs. William Brewster, John E. Thayer, and J. Lewis Bonhote, for the loan of specimens without which the present study would have been quite impossible.

GENERAL NOTES.

Nesting of Man-o'-war-bird (*Fregata aquila*) **in Cuba.** — Puerto Escondido is a small and from the open sea invisible port on the south coast of Cuba a few miles to the east of Guantanamo Bay. It was used in the old days as a pirate retreat, being admirably fitted for the purpose by its narrow entrance and inconspicuousness, and is so mentioned in 'Tom Cringles Log' by Mr. Scott. The name Puerto Escondido means the Hidden Port. It will now form part of the U. S. Naval Station at Guantanamo Bay and will therefore be American territory. In this port is a small Key — Cayo Guincho — about 100 feet in diameter composed mostly of mud upon which grows, in the center, a large mangroove tree surrounded by smaller ones in the water. Upon approaching the key on Dec. 23, 1910, large numbers of Man-o'-war-birds were seen flying about it and upon a closer inspection it was noticed that the large tree had a number of nests upon it. The birds, frightened by the launch, left the nests so hurriedly that some eggs were knocked out, while below, among the roots of the smaller mangroves in the water, two species of "snapper" (*Neomœnis cyanopterus* Linn. and *Neomœnis griseus* Linn.) were greedily feasting on the fallen eggs.— Charles T. Ramsden, *Guantanamo, Cuba.*

American Merganser in South Carolina.— On January 2, 1911, I secured the first authentic record for the American Merganser (*Mergus americanus*) in this State. Mr. Arthur T. Wayne, in his 'Birds of South Carolina,' refers this species to a hypothetical list, and declares that to the best of his knowledge it has never been taken in the State. The specimen here recorded was shot on Back River near its junction with the Cooper, after having partially swallowed a mullet ten inches in length. The weight of the mullet in its throat destroyed its balance and made continuous flight impossible. The bird rose half a dozen times but with each attempt at escape could gain only a few yards.

Several years ago a Merganser was taken on the upper Cooper River which I afterwards decided was the *Mergus americanus*, but as this specimen was not preserved I have been on the lookout during the past season for another to prove the occurrence of the species in South Carolina.

The specimen taken on Back River is a fine adult male in full plumage with the breast and under-parts a delicate peach-blossom color. The skin is now in the collection of the Charleston Museum (Spec. No. 7258).— Caspar Chisolm, *Charleston, S. C.*

Additional Records of the European Widgeon (*Mareca penelope*).— The last captures for the interior I recorded in 'The Auk' (Vol. XXII, 1905, p. 206). As a matter of convenient reference I now add to the list three specimens.

In his 'Preliminary Catalogue of the Birds of Missouri,' 1907, p. 33, Mr. Otto Widmann records the capture of a male bird shot by Dr. A. E. Rives of East St. Louis, Ill., in the vicinity of St. Louis, April 10, 1905. In the 'Forest and Stream' of Jan. 28, 1911, Mr. Albert G. Holmes of Green Bay, Wis., records the capture of a male European Widgeon which came to his decoys while hunting on Point Au Sable, Green Bay, Wis., Nov. 11, 1906, and a second specimen, also shot by him in the same location Oct. 23, 1910.

Mr. Holmes writes me that he believes these Widgeon to be more numerous than is generally supposed, and are considered hybrids by gunners, as he himself first thought until he learned the characteristic differences between the English and American species from an old hunter naturalist who knew the former in the Old World before settling here. Neither of these Wisconsin specimens were preserved. These records make the twenty-third for the interior.— Ruthven Deane, *Chicago, Ill.*

A Banded Baldpate shot at Currituck, N. C.— On January 5, 1911, a member of the Currituck Shooting Club of North Carolina shot a male Baldpate (*Mareca americana*) that had on its leg a band, numbered "7206 R." This may be interesting to the man who tagged the bird.— John E. Thayer, *Lancaster, Mass.*

A Second European Teal (*Nettion crecca*) **in Maine.**— On March 26, 1910, I was called upon to examine a specimen of the European Teal in the flesh, which had been taken a day or two earlier at Scarborough, Maine. During the day, the bird was examined by Messrs. Nathan C. Brown and Walter H. Rich. It was a male in good plumage. The skin passed into the possession of Dr. Henry H. Brock, of this city. The sternun, shoulder girdle, and sacrum are in my possession.

The only other occurrence in the State known to me is the one recorded by Dr. Brock, as taken in Casco Bay, April 6, 1903 (Auk, XXIV, p. 94).— Arthur H. Norton, *Portland, Me.*

The White-winged Scoter (*Oidemia deglandi*) **in South Carolina.**— In 'Birds of South Carolina,' 1910, p. 218, I placed this species in the hypothetical list on account of insufficient evidence of its occurrence in the State. I now, however, wish to record a specimen that I observed on January 20, 1911, on the Wando River. I was *en route* to "Cat Island," and when off that place I observed a large, black Scoter flying up the river. When the bird was abreast of me I was surprised to see that the wings (speculum) were white, for long before it came within good view I was satisfied that it was a Surf Scoter (*O. perspicillata*). The distance was too great for a successful shot, but I watched the bird with longing eyes until it finally disappeared from vision.

Although mussels and other shell-fish are found in quantities in the Wando River and the Golden-eye (*Clangula clangula americana*) winters regularly there, few Surf Scoters frequent this stream. — ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Early Date for the Ruddy Duck.— On Labor Day, Sept. 5, 1910, a single Ruddy Duck was seen in Oldham Pond, Pembroke, Mass., by Mr. A. B. Gardner, who assures me that it was not a cripple, and had not been about the pond before that date. There can be no mistake as to the identity of this bird, as Mr. Gardner is perfectly familiar with the species and paddled to within a few yards of this individual.— J. C. PHILLIPS, *Wenham, Mass.*

A Wood Ibis Record for Michigan.— June 19, 1910, a Wood Ibis, *Mycteria americana*, was taken near Monroe, Monroe County, Mich. (on the west shore of Lake Erie), by Mr. J. A. Peterson of that city who brought it in to the shop of Mr. L. H. Eppinger to be mounted, where I examined it in the flesh. It was a juvenile bird, so shot as to be of indeterminate sex. As a matter of record, a photograph of the mounted bird was made and preserved. The species has been in the hypothetical list for this State for some time but this appears to be the first fully authenticated record for it within our Michigan boundaries.— P. A. TAVERNER, *Highland Park, Mich.*

The Nuptial Plumes of Bitterns: A Correction.— In the last number of 'The Auk' (Vol. XXVIII, Jan., 1911, p. 100) I quoted, from an article written by Agnes M. Learned and published in 'Bird-Lore' (Vol. X, No. 3, May–June, 1908, pp. 106–108), a paragraph relating to the white nuptial plumes of the American Bittern. This I characterized as "rather curiously incomplete," failing to notice that it is led up to and made perfectly intelligible by two or three lines which occur above it on the same page in the midst of matter not closely kindred. They run as follows: "Here we saw, one perfect Sunday morning in June (the 9th), the Bittern; but not as we had seen him before, for on his back he wore two clusters of beautiful white plumes that fluttered softly in the morning air."

I trust that Miss Learned will forgive me for overlooking this essential and gracefully worded passage. How I could have done so is difficult to understand for I read her article no less than three times — as I thought, with care. Apparently my eyes see Bittern plumes better in Concord bogs than in printed text; but then light within doors is no longer what it used to be, as every oldish person knows.— WILLIAM BREWSTER, *Cambridge, Mass.*

Nesting of the King and Virginia Rails (*Rallus elegans et virginianus*) **in Philadelphia County, Pa.**— KING RAIL. In 'The Auk,' Vol. XXV, p. 218, I reported having found two nests of this species at Bridesburg, in the northeastern part of this county, where it is a very rare breeder, and now desire to place on record the discovery of two subsequent nests.

The first of these, found on June 12, 1908, situated in a small bulrush marsh, contained 11 half incubated eggs; the other nest, in a different part of the meadows, held 9 eggs (all fresh) on June 18, 1910, and was placed in a thick cattail marsh. Both sets were collected and are now in the writer's collection, and identification was obtained by seeing the birds at the nests on both occasions.

During the summer of 1909, I failed to find any nests or birds in the meadows, where I searched thoroughly for them, but the foregoing nests and birds rewarded my diligent searches during the years of 1908 and 1910, so the King Rail is still to be regarded as a rare breeder in Philadelphia County — at least in the northeastern part.

Virginia Rail.— This rail seems to be increasing in northeastern Philadelphia as a summer resident. I stated in 'The Auk,' Vol. XXV, p. 219, that I had only found two nests prior to 1908, but my persistent searches during the past two years have been rewarded by the discovery of several nests at Bridesburg, and two sets of eggs were collected. A set of 10 fresh eggs was taken on June 10, 1909, and another clutch of 9, highly incubated, on May 27, 1910; both of these sets are now in the writer's collection.

Of the other nests found, two were empty and were apparently never used, being probably deserted on account of being discovered before any eggs were laid, and a brood was raised in a third. In another part of the meadows, in July, 1909, a brood was raised in a marsh, where the young were seen numerous times by different persons.

Mr. Edwin C. Axe, a local taxidermist, tells me of having seen four young rails, undoubtedly of this species, at Point Breeze, a locality on the Schuylkill River, to the south of the city, in the summer of 1905 (?), and of his failure to capture any of them.— Richard F. Miller, *Aramingo, Philadelphia, Pa.*

Hudsonian Godwit (*Limosa hæmastica*) **in Massachusetts.**— During the latter part of the summer, more especially during late August and early September, there was quite a flight of Hudsonian Godwit along the coast. Though this bird is not distinctly very rare within the borders of this State it is so uncommon that but very few are seen or shot in any one season. This summer and fall there were more birds than there have been for a number of years. The total of those I could get definite reliable records of show 25 shot on 17 different dates. There are also records of more seen, some of which are authentic while others are questionable. The latter I have carefully excluded from the list but mention them later on. A reliable gunner at Chatham, who has been shooting for about twenty years, informed me that he had not in his experience seen or heard of their being so many around. All my records are from localities south of Boston, for I found none for the northern part of the State. It may be of interest to tabulate these below:—

Early August, 3, Chatham (two different days).

Aug. 15, flock of 10 lit off blind out of range. Were watched for some time with glasses.

Aug. 26, 2, Chatham.

Last week of August, 4 (2 more seen), Chatham (three different days).

Last week of August, 1, Plymouth.

Sept. 1, 1, Chatham.

Sept. 2, 1, Plymouth.

Sept. 5, 4, Chatham (flock of 30–35 birds).

Sept. 5, 1, West Dennis.

Sept. 6, 1, Yarmouthport.

Sept. 12, 2, Chatham.

Sept. 13, 1, East Sandwich.

Sept. 22, 1, Chatham.

Sept. 24, 1, Chatham.

Oct. 19, 1, Welfleet }
Oct. 22, 1, Welfleet } found in Quincy market, Boston.

In most cases they were lone birds and, contrary to their habits, were tame and decoyed readily. However, on September 5, during a heavy easterly storm with a downpour of rain, a flock of 30–35 birds went over our stand at Chatham. Instead of alighting, as we supposed they would do, for they appeared very much exhausted, they continued their slow flight and disappeared going due south in the heaviest part of the storm. However, a man a short way below us shot three of these birds as we watched them go over him high up, and later we found someone else above us had shot one from the same flock only a minute or two earlier. One of these men estimated that the flock contained over 40 birds, so my figures may be too low or else, after he fired the birds may have separated so that we might have seen only part of the original flock.

I believe Hudsonian Godwit are now rarely seen on the Atlantic coast in such numbers. In August, 1907, a similar flock was seen at Ipswich, out of which several birds were shot, and the gunners there considered such a flock of rare occurrence. Another gunner at Chatham reported having seen a flock of from 50–75 large birds, which from his description probably were Godwit, as he is well acquainted with all the other common shore birds. On inquiring of the M. Abbot Frazar Co., I found but two specimens in their shop being mounted. Mr. F. A. Webster of Hyde Park wrote me that but one bird had been sent to him. He said someone reported having seen a flock of birds at Winthrop, evidently Godwit, and that someone else had shot two which had been eaten. These are the only reports I was able to collect besides the actual records of those shot. Mr. T. C. Wilson of Ipswich writes that he had shot none and to his knowledge none had been seen there this year. Of the specimens I saw the majority were adult birds with distinct traces of their nuptial plumage. Unquestionably there was an unusually large flight of these birds during the early fall.— S. Prescott Fay, *Boston, Mass.*

Note on the Killdeer in Maine.— A detail which is perhaps worth preserving of the great flight of Killdeer (*Oxyechus vociferus*) along the coast of Maine in 1888 has never found its way into print. This relates to the duration of the stay of the birds near Portland. A note by myself[1] made the limit December 4. Dr. Arthur P. Chadbourne's article,[2] dealing with the entire subject of the flight along the Atlantic coast, advanced the date to December 10 on evidence obtained from lighthouse keepers. About the middle of the following January, after my note had gone to press, G. E. Staples, surfman No. 2 of the Cape Elizabeth life-saving crew, reported to me that the plover were seen in twos and threes on the Cape up to December 25, 1888, and that his half-brother, W. D. Dresser, shot three of them on that day. Staples said that about twenty birds were noted after December 4, if all which he saw were to be considered as seen but once. It may be added that Hon. John M. Kaler, of Scarboro, told me at the same time that the Killdeer visited Prout's Neck in that town during the height of the flight.— Nathan Clifford Brown, *Portland, Maine.*

The Passenger Pigeon in Missouri Fifty Years Ago.[3]— In the issue of 'The Youth's Companion' of February 9, 1911, under the head of Nature and Science, I notice an article on the Passenger Pigeon. You say the latest record of a great flock noted by Mr. Wright was in the Mississippi Valley in 1844. I have seen great flocks of pigeons at a much later date in Missouri.

I was born near Pisgah, in Cooper County, Missouri in 1852. In the latter part of the fifties and the early sixties I saw flocks that, as you say, almost darkened the sky. I shall try to tell you how they looked to me and when I saw them, asking you to make due allowance for a boy's method of fixing dates.

On the Moniteau, a creek that runs through Moniteau and Cooper counties, about four miles from Pisgah, is a stretch of land known to this day as "The Pigeon Roost," and there they came by millions. I have watched them for hours.

As I remember, they would start out early in the morning for their feeding grounds and in the afternoon, about four o'clock, they would begin returning to this roost. From that time until it was too dark to see, I have watched that unbroken line stretched against the sky as far as the eye could reach. Not in straight lines they flew; I remember thinking it looked like some mighty river winding its way through the air. In the roosting place the trees were broken in pieces by them and thousands would be left crippled or killed — for the foxes and other wild animals to feed upon.

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[1] Auk, VI, p. 69.

[2] Auk, VI, p. 256.

[3] This and the following note on the Passenger Pigeon were kindly transmitted by the editors of 'The Youth's Companion.'

I remember once in the fall of the year, perhaps November, it was a very windy day, they began alighting within fifty yards of our house in a grove of sumac bushes which were completely broken to the ground by them. I am sure it is no exaggeration to say that five acres of ground were covered by them. My uncle went out with his old single barrelled shot gun and brought in a sack full. He gave us a common sized water bucket full.

In the sixties the method of fattening cattle for the market was to cut the corn in the fall and shock it. These shocks were afterward hauled out and scattered on the ground for the beef steers. As a matter of course a great deal of shelled corn was left on the ground. I have seen those lots literally covered with pigeons. My brother, three years older than myself, was allowed to handle a gun but I was n't old enough, so all I might do was watch him and pick up the pigeons. He came in one day and measured what he had gotten at five shots. It was one of those large old time dish pans and it was even full. I thought if I had had the gun I should have killed a barrel of them. As a matter of fact, though, they were shy and a little difficult to shoot, the least noise or movement frightening them to instant flight.

This was, I am sure, as late as 1862, for my father was in the army and the only way we could keep a gun was to hide it in a hollow tree when not in use, for if the "Federals" did n't get it the "Rebels" would if kept in the house.

I left Cooper County in the spring of '65. Whether pigeons were seen here after that I do not know.

We came to this (Cass) County, since then I have seen a few small flocks and killed two or three pigeons.

The last I ever saw was here on the farm where I now live. There must have been ten or twelve of them sitting on an old dead tree, their favorite resting place, I had my gun and I thought I would surely have pigeon for dinner, but just as I was ready to shoot away they went, and little did I think, as I watched them disappear, they were the last I should ever see of a species of bird that was once numbered by the millions. This I think was in 1882 but it may have been a little earlier.

They are certainly gone, and who can explain it? Surely the hunters are not responsible for it in this instance and in so short a time.

With them have gone the Prairie Chicken, the Wild Goose and the Pheasant [Ruffed Grouse].

From 1860 to 1870 they were to be found in this State in great numbers. Now a Prairie Chicken is rarely seen, and only once in a very great while one may hear the once familiar "honk! honk!" of the Wild Goose, but he flies so high one scarcely can see him. I have not seen a native pheasant for twenty-five years.

I have watched, with much interest, the efforts of our legislatures to stock our country with new varieties of game, and have wondered if something, instead, might be done with reasonable success, to restock with some of the old friends so numerous here in the early days.

Such a movement would have the hearty coöperation of every reputable citizen of this portion of the country, as does every effort on the part of the Government to protect our remaining game.— THOS. J. GEORGE, *Gunn City, Mo.*

Passenger Pigeons in Eastern Iowa, in 1856–1860.— My father, Gustavus Allbee, moved with his family from Rockingham, Vermont, to Davenport, Iowa, reaching the latter place December 6, 1855. We lived in Davenport during the winter, moved to a farm 14 miles from there in March, 1856, and to another farm near by, upon which I now reside, in March, 1857; and although but a mere boy at the time, I very distinctly remember flocks of these pigeons passing both homes, that were miles in length and streamed over, reaching further than the eye could reach in either direction. Equally distinctly I recall sitting in a clump of bushes most of an afternoon with my uncle as he shot his bag full of them; also of how I enjoyed eating them afterwards.

As they passed over this home they were here as late as 1857, and I feel quite positive they appeared for two or three seasons after we came here, or up to 1859 or 1860, but I may be mistaken as to this. But that uncle shot the pigeons on this place and that I ate them here, and that mile after mile of them passed over me as I worked in the fields on this farm is beyond any doubt whatever. My uncle sometimes sang, " If I could shoot my rifle clear at pigeons in the skies, I'd bid farewell to pork and beans and live on pigeon pies."— E. A. ALLBEE, *Montpelier, Iowa.*

Old Notes on the Passenger Pigeon (*Ectopistes migratorius*).— In an old note book formerly belonging to Mr. Luther Adams of Townsend, Massachusetts, and loaned me by one of his descendants, I have copied verbatim some interesting data contained therein relating to the Passenger Pigeon. Mr. Adams, who was a farmer and horticulturist, availed himself of the opportunity afforded him by netting these birds, and the old nets which he used, with many feathers clinging to them, are still on the premises. As a record of what took place in the movements of these birds from August 26, 1847, to September 11, 1848, in this particular locality, it is particularly interesting, as it gives the data for the spring and summer months of 1848. Townsend, is 48 miles from Boston, the country is springy and hilly, with hard woods (many chestnuts) and pine. The pigeon stand was located on a high knoll, which is now covered with pine trees a quarter of a century old. The number of pigeons taken in 1847 was 5,028; in 1848, 1,926 were taken.

"*Pidgeon Bate 1847.*

found 9 bushel of Buckwheat
paid Benj Barret four dollars and fifty cents for Buckwheat'
paid Jonas farnell $2.00 for wheat
paid Saml Manning $1.50 for wheat
paid Edson $1.00 for work
paid Randal Cudry $3.00 for use of place
paid John Adams $0.50 for use of place
paid seventy-five cents for other articles.

The amount of Pidgeons taken in 1847.

	dozen
Aug. 26 caut sixteen dozen	16
Sept. 2	61½
“ 4	25½
“ 6	58
“ 7	42
“ 8	52½
“ 11	36
“ 13	34½
“ 16	8[illegible]
“ 17	52½
“ 20	4
“ 23	10½
“ 24	9½
“ 27	8½"

"*Pidgeon Bate 1848.*

Apr 29, found one bushel of wheat $1.50

The amount of Pidgeons taken in 1848.

	dozen
May 1 three dozen & eight	3.8
“ 8	3.1
“ 15	3.
“ 22	4.
“ 29	3.
June 1	3.
“ 5	2¼
“ 7	5½
“ 9	7¼
“ 12	2½
“ 16	5½
“ 19	2¼
“ 23	2¾
“ 26	3.
July 3	2½
“ 6	5.
“ 14	2.
“ 17	3.
Aug. 21	2.
Sept. 4	8.
“ 5	9¼
“ 6	55
“ 7	6½
“ 11	19½"

George H. Mackay, *Nantucket, Mass.*

The Passenger Pigeon — Only One Bird Left.— In 'The Auk' (Vol. XXVI, p. 429, 1909) I published a note entitled "The Passenger Pigeon — Only One Pair Left," it is with deep regret that the title must now read as above. On July 10, 1910, the male bird died at the age of about twenty-five years. Mr. S. A. Stephen, General Manager of the Cincinnati Zoölogical Society, writes me that the bird apparently died of old age not having shown any signs of tuberculosis, or other disease, but extreme weakness prevented his walking around. The remaining female, and probably the last living one of her race, came from the flock of the late Prof. Charles O. Whitman, and is now about fourteen years old, and in good health and plumage. The male bird was not preserved on account of the poor state of plumage.— Ruthven Deane, *Chicago, Ill.*

A Recent Turkey Vulture (*Cathartes aura septentrionalis*) **in Maine, and Revision of Earlier Records.**— On August 27, 1910, a Turkey Vulture was shot on Cape Elizabeth, Maine, and on the 30th it came into my hands. I was told that it swooped down among some chickens, and on the supposition that it was a hawk it was shot. It proved to be an adult female, with moult well advanced. It was rather fat, and with stomach nearly empty weighed about 4¼ pounds, about two pounds less than the weight given by Audubon. It carried a No. 8 shot embedded and healed in the left ulna and had lost the distal joint of the middle toe of the left foot, and the next joint was stiff.

This is apparently the fifth specimen to be taken and preserved in the State, though the number of accepted occurrences will now number nine.

The statements of Josselyn, Pennant and Wilson cannot be regarded as affording any specific Maine records. The first appears in the Boardman and Verrill list of 1862, based upon a specimen taken near Calais.[1]

The second is chronicled by Mr. Nathan Clifford Brown, in the 'Rod and Gun,' December 15, 1874. This is the bird taken "about the first of November" that year in Standish, Cumberland County. Later compilers have accredited this to Mr. Everett Smith, who also recorded it.[2] The 'New England Bird Life,'[3] in quoting from Smith, as cited, dropped the name of the town (*i. e.*, Standish) and the word "County," the record there appears as Cumberland, Maine, thus taking the aspect of another record, though fortunately the citations makes the case clear to anyone having access to the literature in the case.

The third specimen, taken at Buxton about the last of December, 1876, is also recorded by Mr. Brown.[4]

The fourth, taken at Denmark, Maine, March 15, 1883, by Mr. Abel Sanborn, has been the source of considerable confusion. Apparently this was first reported in the Lewiston 'Gazette,' of April 20, 1883 (*fide* Gushee), and what evidently is a clipping of this article is published by A. R. Gushee in 'Forest and Stream,' April 26, 1883.[5] The place is not stated, though the capture is accredited to Abel Sanborn of East Fryeburg. In the same journal for May 10, Everett Smith presents the same record, giving the date of capture as March 15, 1883, East Fryeburg.[6] In 1898 Mr. James C. Mead corrected the place of capture, so the record should stand, Denmark,[7] Maine, March 15, 1883.

In the 'List of the birds of Maine' by O. W. Knight, this last bird appears under both, the Turkey Buzzard (Gushee)[8] and Black Vulture (Smith)[9].

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[1] Proc. Boston Soc. N. H., IX, 122.

[2] Forest & Stream, III, 324 (Dec. 31, 1874).

[3] Vol. II, 137.

[4] Proc. Portland Soc. N. H., II, 23.

[5] Vol. XX, 245.

[6] *Ibid.*, 285.

[7] Maine Sportsman, July, 1898, p. 13.

[8] Bull. 3, Univ. of Maine, 57.

[9] *Ibid.*, 58.

Unfortunately in changing this, the original citation seems not to have been consulted, and so two other errors have arisen, together with a typographical error due to one of these.

The first error is that Mr. Smith[1] has been made to appear to have recorded a Black Vulture rather than a Turkey Buzzard. Second, an error of one year has been made in the date,[2] through citing a secondary record. Third, the typographical error makes the record stand 1892,[3] nine years later than the actual date.

There are also four instances of the occurrence of this bird recorded where they were seen and not taken, or taken and not preserved, but identified by description. These are, one seen at Whitney's Hill, Bangor, by the late Manly Hardy,[4] two caught in bear traps, and described to Mr. Hardy[5] and one seen at Scarborough by Ruthven Deane.[6] Thus the Maine records of the Turkey Buzzard should stand:

One taken near Calais prior to 1863 (Boardman, Proc. Boston Soc. N. H., IX, 122).

One taken at Standish, November, 1874 (Brown, Rod and Gun, December 15, 1874).

One taken at Buxton, December, 1876 (Brown, Proc. Portland Soc. N. H., II, 23).

One taken at Denmark, March 15, 1883 (Gushee, F. & S., XX, 245; Smith, F. & S., XX, 285, and Mead, Maine Sptsm., V, July, 1898, 13).

One seen at Whitney's Hill, near Bangor, prior to April, 1897 (Knight, Bull. 3, Univ. of Me., p. 57).

Two caught in bear traps, prior to 1905 (Deane, Auk, XXII, 79).

One seen at Scarborough, Maine, August 5, 1904 (Deane, Auk, XXII, 78).

One taken at Cape Elizabeth, August 27, 1910 (recorded here).— ARTHUR H. NORTON, *Portland, Me.*

The Pigeon Hawk (*Falco columbarius*) **Wintering on the Coast of South Carolina.**— On November 29, 1910, I saw an adult of this hawk flying rapidly over Oakland Plantation, Christ Church Parish, and on January 14, 1911, I observed a fine adult specimen in my yard, which was on the top of a Pride of India tree, but failed to secure it. Again on January 16, 1911, the same bird was observed by the writer, but although I followed it for nearly half a mile I was unable to get a shot at it, as it was very restless.

The coloration appeared to be very dark — in fact almost black — suggesting the probability of its being a representative of *Falco columbarius suckleyi*.

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[1] Auk, XXII, 79, and Birds of Maine, 213.

[2] Auk, XXII, 79.

[3] Birds of Maine, 213.

[4] Bull. 3, Univ. Me., 57.

[5] Auk, XXII, 79.

[6] Auk, XXII, 78; Journ. Me. Orn. Soc., VII, 19, 20.

During the past thirty years that I have spent in observing birds, this is the first instance that I have ever detected this hawk in the winter.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Recent Winter Occurrences of Two Hawks in Maine.— Evidence accumulates to the effect that the Pigeon Hawk (*Falco columbarius columbarius*) is to be found in Maine in winter more often than has generally been supposed.[1] I saw it twice during the season of 1910–1911 at Portland. On January 24, 1911, at 11 A. M., one flew across Temple Street, in the heart of the business section of the city, distant about a hundred yards from the window at which I was standing, rose gradually and disappeared towards the west. On February 7, at 3.30 P. M., during a snowstorm, one flew down Middle Street, passing the same window within about thirty feet and clearly indicating the plumage of immaturity.

The chances are that the Sharp-shinned Hawk (*Accipiter velox*) is also a more frequent visitor in Maine in winter than it has been thought, for there has not been a great deal of systematic observation here at that season. I believe that only three trustworthy records of its appearance have yet been made,[2] though it is stated in the Journal of the Maine Ornithological Society, Vol. XI, pages 15 and 16, by Miss Nellie F. Dunton, that she saw a Hawk, "probably a Sharp-shinned," in winter at Winnegance. I happened upon a fourth instance, February 11, 1911, when I saw one of these Hawks near the western end of Danforth Street, Portland, about 2 P. M. It perched for a few moments in a tree overlooking the harbor, then flew away in the direction of Cape Elizabeth.— NATHAN CLIFFORD BROWN, *Portland, Maine.*

The Saw-whet Owl in Georgia.— On January 1, 1911, I procured a fine specimen of the Saw-whet Owl. It was a female in what seems to me to be an extremely gray phase of plumage. The reddish tinge on the back and wings is so very slight as almost to require a stretch of the imagination to see any red or brown there. The streaks on the breast are, however, fairly ochraceous. It was an old bird, measuring 7½ inches. The ovaries were numerous and some of them swollen to the size of No. 6 or No. 8 shot. No traces of undigested food could be found.

The locality was a small island known as Buck Hummock, just south of Tybee. The bird sat quite still in a clump of bushes and showed no uneasiness at our presence. In fact my companion had ascended and descended a large pine tree after eagle's eggs, passing within six feet of the little owl, and we did not discover it until we were seated on the ground lunching. The specimen has been mounted for Mr. W. J. DeRenne of this city, owner of the Wormsloe collection.

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[1] Norton, Auk, XXVII, p. 207; Brown, l. c.

[2] Smith, Forest and Stream, XX, pp. 24–25; Brownson, Journ. Me. Orn. Soc., VII, p. 21; Norton, ibid., IX, p. 9.

I am not aware that this species has been before detected in Georgia. I found it once in South Carolina, many years ago, and a specimen was secured there by Mr. Alfred Cuthburt. It is now in the collection of Dr. E. E. Murphy of Augusta, Ga.— W. J. Hoxie, *Savannah, Ga.*

A Snowy Owl in New Jersey.— A Snowy Owl (*Nyctea nyctea*) was shot on the line between Orange and South Orange, New Jersey, on November 19, 1910. The bird was secured by a man of the name of Adams, in the employ of Mr. L. Bamberger, of 602 Center Street, and was placed for mounting in the hands of Mr. Ray Baldwin, a taxidermist of Newark. A letter written to the latter asking for particulars as to whether the bird was unusually white, as indicated by Mr. Adams, failed to elicit any statement.— B. S. Bowdish, *Demarest, N. J.*

Northern Pileated Woodpecker in Massachusetts.— Mr. Henry P. Meade has kindly given to me a Northern Pileated Woodpecker (*Phlœotomus pileatus abieticola*) which he shot in Harvard, Mass., October 15, 1910. It is a young male. This is an extremely rare bird in this locality.— John E. Thayer, *Lancaster, Mass.*

Breeding of the Raven in Pennsylvania.— The extreme and increasing rarity of the Northern Raven (*Corvus corax principalis*) in the eastern United States makes it advisable to place on record the nesting of a pair in Center County, Pennsylvania. In 1909 the nest was found on a ledge or shelf in a nearly perpendicular wall of rock in a gap in the mountains. In middle April, when found, it held three full-fledged young. In 1910 a nearly finished nest was found on the same cliff on February 19, and the set of five eggs was collected on March 1. A second set of five eggs was found on March 16, and Mr. D. E. Harrower found a third set of four on April 10.

In early May (6–7), 1910, while back in Huntington County, I saw a pair of Ravens with a young one scarcely able to fly and easily distinguishable by its weak, crow like notes.— Richard C. Harlow, *State College, Pa.*

Clarke's Nutcracker in Illinois.— While in Milwaukee recently, Mr. Shrosbree, chief taxidermist of the Milwaukee Public Museum, told me of the capture of a specimen of *Nucifraga columbiana* by his brother, near Chicago. Upon inquiry of Mr. Frank Shrosbree, he informed me as follows: " I shot the Clarke's Nutcracker on the 9th of October, 1894, at Gross Point, Illinois." Gross Point is a small German settlement in Cook County, about 15 miles northwest of Chicago. This is, I believe, the first record of this species for Illinois.— Henry K. Coale, *Highland Park, Ill.*

Evening Grosbeak (*Hesperiphona vespertina*) **at Lyons, N. Y.**— As this bird is such a very rare winter visitant in this section, I take the liberty of reporting its occurrence in our vicinity. During the latter part of December, the Evening Grosbeak was reported in Rochester, N. Y., the first time seen there since the winter of 1889–90, but it had not been observed here. Since then I have been watching carefully, hoping to make a record of this beautiful bird in our county. About ten days ago they were first seen in Lyons. Since that time they have been reported, almost daily, as occurring in flocks of from 6 to 10, in some section of the town, and to-day, February 4, 1911, I recorded 30 of these birds feeding about in the maples and picking up the buds from the ground which a recent wind and wet snowstorm had shaken from the trees. Both sexes were represented almost equally in the flock and exhibited marked tameness.

It will be gratifying indeed if the erratic travels of these birds become more frequent and eastern people have the pleasure of becoming better acquainted with this common bird of the Northwest.— E. Earl Elliott, *Lyons, N. Y.*

The Evening Grosbeak in New Hampshire.— We have with us here at this date (Jan. 2, 1911) a flock of eight Evening Grosbeaks. They have been here for a month, and have been seen every day on one of our back streets on a small ornamental tree which is covered with seeds on which they feed. They seem to make their headquarters in some pines near by. They come out to feed two or three times a day.

They are very handsome and quite uniformly colored though there is a slight difference in shades. They are very tame and will not notice anyone that may be within a few feet of them and they have had many visitors as they are quite a curiosity in this vicinity as they are in any part of New England.— C. H. Storrs, *Lebanon, N. H.*

The Evening Grosbeak at Lancaster, Mass.— On Sunday, January 15, 1911, as I was walking along the main street, I was attracted by a peculiar whistle, and looking around I saw three Evening Grosbeaks (*Hesperiphona vespertina vespertina*) light on the ground under some spruces, not twenty-five feet from where I stood. They were eating some kind of seeds. There was a male in fine bright plumage and two dull-colored birds, which I took to be females. These are the first Evening Grosbeaks I have ever seen in Lancaster, although they have been reported from the next Town (Leominster).— John E. Thayer, *Lancaster, Mass.*

Harris's Sparrow (*Zonotrichia querula*) **in Southern Idaho.**— On January 1 of this year I took a Harris's Sparrow, female, from a flock of Gambel's (*Z. l. gambeli*) among the brush on a creek bank near this place. There were perhaps 50 birds in the flock, and I am confident that there were several more of the Harris species; in fact, I identified another at a distance of not more than 20 feet. The 1910 Check-List records it as accidental in Washington, Oregon, and California. Apparently this capture extends its range and makes a new record for Idaho. I believe the bird is a not rare winter resident in this section, as I have several times noted a large sparrow resembling the Harris's, though except on this one occasion I have been unable to make a positive identification.— L. E. Wyman, *Nampa, Idaho.*

Nesting of the Rose-breasted Grosbeak near Philadelphia, Pa.— In 'The Auk,' 1907, p. 442, I recorded the nesting of the Rose-breasted Grosbeak (*Zamelodia ludoviciana*) in Philadelphia County, Pa., along the northeastern boundary, in the Carolinian fauna, in which zone it is a rare breeder in this vicinity. This nest was found at Torresdale, along the Poquessing Creek.

In 1909, I found three nests of the Rose-breasted Grosbeak on the other side of this stream in Bucks County, at Andalusia, directly opposite Torresdale, and practically the same locality. The first was discovered on May 18 and held two fresh eggs; the others were found on June 18. One was a new nest and the other a deserted one, containing broken egg shells. Another nest was found at this locality in June, 1909, by Dr. J. B. Ball, of this city, in which were also fragments of eggs, and was an abandoned nest also.

During the summer of 1910, the doctor and I were unsuccessful in our limited searches for the nest of this bird at both of these localities along the Poquessing Creek, although on both of our trips we observed several of the birds.

On April 23, 1910, I observed several Rose-breasted Grosbeaks at both of these localities, which is much earlier than they usually arrive in the vicinity of Philadelphia. The nesting of the bird here as early as May 18, is also an unusual occurrence.— Richard F. Miller, *Aramingo, Philadelphia, Pa.*

The Orange-crowned Warbler in Pennsylvania.— During the spring of 1909 it was my good fortune to be able to establish the occurrence of this bird at State College, Center County, Pennsylvania. During a late flight of warblers on May 16 I observed several which I took to be Tennessee Warblers but on collecting a pair of them, they were found to be of this species. There were probably six or seven in the flock and another taken was too mutilated for preservation. When seen the birds were in willows along a small stream in company with Nashvilles and Northern Parulas and a few Redstarts. This date is remarkable because of the fact that the few Pennsylvania and New Jersey specimens have almost invariably been taken in late February or early March.— Richard C. Harlow, *State College, Pa.*

The Cuban Pine Warbler.— I beg to report having found the Cuban Pine Warbler (*Dendroica pityophila* Gundl.) in the pines at Mayari, on the north coast of Santiago Province in eastern Cuba on May 20, 1909. These pines are locally known as "Pinares de Mayari," and extend over an area of some 50 square miles, the ground underneath them being covered to a depth of from 6 to 12 feet with loose iron ore which is being crushed by the Spanish American Iron Co. and sent to the "States." The altitude of the Pinares is 1800 feet above sea level.

It is worthy of note that this warbler is not found in the pines on the south coast of this province, where I have looked for it diligently; nor is it found, according to Dr. Gundlach, on the Ile of Pines where there are to be found large extents of pine woods. Although there are clumps of other timber scattered here and there through the pine forest *D. pityophila* is not to be found in them, it living strictly on the pines and usually in the highest branches, where were it not for its song it would be next to impossible to locate, as it is very difficult to see among the branches. I have never seen it on the ground and believe it does not leave the trees.

On the above date I found full grown young flying about showing it to be an early breeder. Heretofore it has been reported only from western Cuba, where Dr. Gundlach found it.— CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

A New Breeding Record for Wayne Co., Michigan.— In a hawthorn pasture on P. C. 669, Ecorse Township, August 13, 1910, I found a nest of the Mockingbird containing three young that would have flown in a day or two. The adult birds were present in dirty and worn plumage with a suggestion of molt and with sexual organs reduced to minimum size, indicating a conclusion of the breeding season. The nest was placed two and a half feet above the ground in a hawthorn tree, a typical Brown Thrasher site, but it differed somewhat in construction from the nest of that species or the Catbird. The foundation was composed entirely of dead hawthorn twigs, those with the greatest profusion of thorns being selected. The sides were of the same material except that near and on the top an abundance of small dried aster plants were interwoven, including the stems, leaves and flowers. The inner foundation consisted of black horse-hair, about a quarter of an inch thick on the bottom and thinning to nothing an inch up the sides; this and the inner sides of the walls were concealed beneath a covering of dried aster leaves and flowers. The nest presented an excellent example of protective coloration, for viewed from any angle above its surface the general aspect of gray blended with the backs of the young birds. On the other hand it was very poorly concealed, in fact, I first saw it at a distance of about thirty yards. Later, both the pasture and surroundings were thoroughly searched but no trace of a previous brood was found. Of the three nestling Mockingbirds two were males and the other a female.

Southern birds occasionally appear here during the spring migrations, apparently carried north in flocks of other species. This may explain the presence of these Mockingbirds. The fact that they were a breeding pair, however, suggests deliberate migration and so late in the season as to derive no guidance from the normal spring movement. This idea is suggested by the breeding Dickcissels that I have found here. One afternoon, in early June, 1899, I searched some ten acres of neglected land that had been my favorite collecting grounds in 1890. There were few, if any, Dickcissels present for I saw none. This was on P. C. 405 and within the present city limits of Detroit. I happened to be in the neighborhood on July 30 and was at once attracted to this field by the songs of about a dozen males and later estimated the colony to consist of fifteen pairs. They never returned to that locality and, with the exception of one bird in Monguagon Township and two in Fairview Village in 1904, none were seen until 1906. Practically all my spare time in 1906 was devoted to a portion of Grosse Pointe Farms and Township and probably the male noted June 10 was the first arrival, and the first female was seen June 24. Three nude young in the nest were located July 29, and a female was flushed from her three eggs August 5. In 1907 I first visited this locality June 30 but found only one pair and their nest containing two fresh eggs. Three additional pairs were present July 7, which was my last visit until 1909–10 when not a bird could be found there nor anywhere in the county.

On consulting available data regarding Mockingbirds breeding north of their normal range I find that from one to several pairs would nest in some locality for a season or two and then disappear, exactly as did the two above colonies of Dickcissels, which seems to place both species here in the class of irregular invaders. Time will probably show that the present occurrences of Mockingbirds in the north are efforts in the direction of permanent summer residence. Last summer was unusually dry and warm here and our local pair may have traveled the whole distance through conditions not materially different from those in their normal range.— J. Claire Wood, *Detroit, Mich.*

Townsend's Solitaire in Eastern South Dakota.— A specimen of *Myadestes townsendi* was closely observed at Vermillion, extreme southeastern South Dakota, on January 9, 1911. Having observed this species at several localities, from Alaska to Arizona, I have not the slightest doubt as to the identification. This species breeds sparingly in the Black Hills, and this individual may have been driven here by a severe west wind which prevailed during the first week of the month.— Stephen Sargent Visher, *State University, Vermillion, S. D.*

A Remarkable Number of Robins in Maine in Winter.— The winter of 1910–1911 was rather steadily cold in southern Maine. December and January brought little snow, and the ground was bare most of the time during those months; but in February much snow fell. Nearly if not quite throughout the season there were many more Robins in Portland and its neighboring towns than are to be expected there in winter, and their abundance for a part of the time appears unprecedented. Reports of the birds began to reach me early in December, but Miss Caroline M. Stevens, of Portland, whose father's house occupies a site especially favorable for observation, tells me that she noticed unusual numbers late in November as well as afterwards. On December 31 I found a least twenty-five feeding in some open lots in the Western Promenade section of the city. The next day I counted more than a hundred scattered about the same lots, in hedges, in the trees of an old orchard and on the ground; there were not less than a hundred and twenty-five of them. On each of the five succeeding days I found an equal number in the same locality. There were but forty in evidence on January 6, but on January 7 there were more than two hundred concentrated within a distance of a hundred yards on Arsenal Street, while several dozen others were grouped in trees not far away. On January 8 and 9 this large flock was still in the neighborhood. Then a week passed in which I could not find a single individual, though I made a search daily of the district previously frequented by the birds. On January 17 a flock of twelve appeared on Arsenal and Bramhall Streets. For the subsequent ten days my record was as follows, the birds always occurring in the same part of the city:

January 18, twelve birds.
" 19, none.
" 20, fourteen birds.
" 21, ten birds.
" 22, two birds.
" 23, twelve birds.
" 24, none.
" 25, none.
" 26, eleven birds.
" 27, eleven birds.

Ten days now elapsed during which I saw none. On February 6, however, I came upon a small flock — perhaps half-a-dozen birds — at the corner of Free and South Streets, in the center of the city. They were moving through the tops of tall elms and did not long remain in sight. A good deal of fruit was still left on some of the mountain ash trees; but, in spite of frequent search within the limits of Portland, I could find no more birds until February 25, when I discovered one in the Western Cemetery.

In the meantime from many points near the city reports had continued to come to me of the presence of great numbers of Robins. The newspapers had also taken up the subject. I heard directly from trustworthy persons in Scarboro, Cape Elizabeth and Old Orchard and on Cushing's, Peaks and Great Chebeague Islands. The largest flocks were generally said to contain from thirty to forty birds, but I was told of one on Cape Elizabeth of one hundred or more and one on Cushing's Island of fully two hundred. The main body apparently withdrew from all these places before or about the middle of January, as was the case in the city. Nevertheless Mr. Robert T. Sterling, of Peaks Island, reported a flock of thirty or forty on February 19.

The food of the birds which I watched in Portland consisted mainly of mountain ash berries. The trees were heavily laden with fruit, this year, and there are at least fifteen of them in the Western Promenade section, which may be roughly estimated as covering fifty acres. A fine buckthorn hedge was soon stripped of an abundant crop of berries: in fact the Robins ate these with evident preference. They appeared not to like barberries, of which they might have had an ample supply; only once did I see any birds testing them, and then but a few. Suet and other contributions of sympathetic householders were untouched so far as I observed, and no attention was paid to nests of the brown-tail moth.

The sexes were about equally represented amongst the birds. No other species associated with them; but on January 9 I saw several of them attacked and vigorously chased about by English Sparrows. The large flocks were restless and noisy; the small flocks of later date were sluggish and usually silent.— NATHAN CLIFFORD BROWN, *Portland, Maine.*

Winter Ranges of Geese on the Gulf Coast; Notable Bird Records for the same Region.— The writer noted in the July, 1910, Auk, the fact that Blue Geese (*Chen cærulescens*) were very abundant in the Mississippi Delta and the vicinity of Vermillion Bay, La. Further field work under authorization of the Biological Survey during the present winter shows that this is the only part of the Gulf Coast that is visited by large numbers of this species. At Cameron, La., further west they were numerous November 28 to December 6, 1910, but over-shadowed in numbers by both Canada and Snow Geese, while at Gum Cove in the southwestern part of Cameron Parish, La., they were scarce, only a few being seen now and then among the Snow Geese. The writer saw two here January 2. One was seen at Lake Surprise near Galveston, Texas, December 12, 1910, and two at Matagorda, Texas, December 21.

These observations are in harmony with previous records of the occurrence of the Blue Goose, and point to the following conclusions: the center of abundance of the species is a narrow strip extending along the coast of Louisiana from the Delta of the Mississippi to a short distance west of Vermillion Bay. To the eastward the bird is known only as a straggler, and to the west it diminishes gradually in numbers, being scarce on the extreme western coast of Louisiana and rare on the Texas coast.

Passing to the Snow Goose (*Chen hyperboreus*) it was noted in 1910 that in the Mississippi Delta and Vermillion Bay regions, there was one Snow Goose to about each 25 Blue Geese, and that the Snow Geese formed no flocks of their own. At Cameron, La., during the present season (Nov. 28–Dec. 6, 1910) they were abundant, and at Gum Cove (Jan. 2–5, 1911) they were very abundant. Flocks containing many thousands were seen daily in this locality. The species was common at Lake Surprise (Dec.

8–16, 1910) and Matagorda, Texas (Dec. 20–23, 1910) but only one small flock was seen at Rockport (Dec. 25). Thus it appears that the center of abundance of Snow Goose on the Gulf Coast is southwestern Louisiana. Like the Blue Goose it decreases rapidly to the eastward (though not so abruptly) and diminishes more gradually westward and southward along the Texas coast. So far as the Louisiana coast is concerned, the ranges of these two species are complementary. The Blue Goose has its stronghold in the eastern section, the Snow Goose in the west, and they occupy the intervening territory in numbers inversely proportional to the distance from the center of abundance.

The same general law that appears to govern the distribution of these two species applies also to the White-fronted Goose (*Anser albifrons gambeli*). The only place on the Gulf Coast where this species is abundant is Gum Cove, La. Small numbers were seen at Cameron, and according to the testimony of hunters the species is rare at Vermillion Bay and the Delta. Only small numbers occur on the Texas coast.

Each of the three species above mentioned has its center of abundance, to the eastward and westward of which it becomes less numerous, the decrease in numbers being most abrupt to the eastward. This law does not apply to the Canada Geese, except perhaps to the smaller ones probably typical of the subspecies *hutchinsi*. These little geese equal their larger relatives in numbers at Gum Cove, La., and Galveston, Texas. They were not noted at Vermillion Bay or the Mississippi Delta, La., and occur in reduced numbers further south (than Galveston) along the Texas coast. The large Canada Goose is abundant in suitable places from Rockport, Texas, at least to Dickerson Bay, Fla. As it is rare along the Atlantic coast from South Carolina southward, practically all of the Gulf Coast birds must be of Mississippi valley origin. Other facts point to the inference that western Florida gets the bulk of its waterfowl via the Mississippi valley. One especially striking instance is the occurrence of *Marila collaris*, a rare bird on the south Atlantic Coast, as the most important game duck in certain parts (such as Micanopy) of northwestern peninsular Florida.

A wandering Blue Goose which the writer was fortunate enough to get on St. Vincent Id., Fla., November 1, 1910, was perhaps following this waterfowl trail. It has the distinction of being the second Florida specimen recorded.

Other noteworthy records are:

Mergus serrator. Two specimens taken at Rockport, Texas, Dec. 29, 1910.

Clangula clangula americana. Lake Surprise, Texas, Dec. 10, 1910; Rockport, Texas, Dec. 29, 1910.

Harelda hyemalis. Lake Surprise, Texas, Dec. 15, 1910. Second specimen from the State.

Branta bernicla glaucogastra. A specimen in Rockport, Texas, mounted by Andrew Sorenson, and said by him to be the only one ever known to be taken there, furnishes the first record of the species for the State.

Phœnicopterus ruber. One was seen at Cameron, La., Dec. 6, 1910. Apparently the first definite record for Louisiana.

Querquedula cyanoptera. Dr. A. K. Fisher sends me notes on this and the following species. A Cinnamon Teal was killed by Mr. John Dymond at the Delta Duck Club, La., Jan. 15, 1911, and Mr. F. M. Miller, President of the Board of Game Commissioners, says that the species is not uncommon in Louisiana this year, he having reports of about 20 specimens taken.

Melopelia leucoptera. One of a pair was collected by Mr. Gus Smith at Venice, La., about Nov. 20, 1910.— W. L. McAtee, *Biological Survey, Washington, D. C.*

Enormous Death Rate among Water Fowl near Salt Lake City, Utah, Fall of 1910.— In reply to a letter of inquiry I am in receipt of some interesting information (dated Dec. 10, 1910) from the State Game and Fish Commissioner of Utah, Mr. Fred W. Chambers of Salt Lake City: ". . . . will state that early in September, 1910, a malady came amongst the ducks and wild water fowl of this section, which has proven very disastrous, it being estimated that over two hundred thousand (200,000) have died from this disease. Mr. J. H. Mohler, Chief of Division of Pathology, Washington, D. C., who took the matter up, states that the disease is intestinal coccidiosis — which from appearances is a sort of cholera. On account of having scarcely any rain during the past season, the water was very low, and was to a great extent used for irrigation purposes. The ducks nested and hatched in the various sloughs, and the young being unable to fly, subsisted in the waters of said sloughs, which from long drought had become stagnant and filthy. The disease is supposed to have started in this way. Conditions have cleared up and very few sick ducks can now be found. The disease is not infectious to animals and people, as has been reported." — Henry K. Coale, *Highland Park, Ill.*

Notes on Some Species from Eastern Oregon.— The winter of 1909–1910 was perhaps the most severe that has been experienced in eastern Oregon during the past 20 years. The unusual amount of snow, as well as the long continued cold, caused the death of many birds and to some extent forced others to change their normal habits.

A flock of a dozen *Oreortyx* was several times seen feeding on stable refuse hauled out from the town of Vale, Malheur County. Just where these wanderers came from would be a problem, as the nearest body of timber, the natural home of the species, is about 75 miles to the westward, and so far as I can learn the species is not found there.

The unusually deep snow handicapped the jackrabbits, which were very abundant at this time, rendering their capture by the ever hungry coyote merely a matter of a moment's effort. Early in the winter I began to notice that a small company of Magpies accompanied each and every coyote. A scattered flock, flying from sage-bush to greese-wood, across the hills, was, in almost every instance, preceded by a "Government Dog," and the killing of a rabbit several times per day was the inducement to the feathered escort, which shared freely in the leavings of the wolf.

Early in the spring of 1910 a male English Sparrow was seen 12 miles from Vale, in the sage-brush, vainly attempting to induce a female Brewer Blackbird to begin housekeeping with him. So far was the wanderer from his fellows in Vale that I was surprised, never having seen one even half a mile from town before. No more strays were seen until in the fall, when on the upper Willow Creek, near the base of the Burnt River Mountains, I found a small flock of from four to ten on every ranch. This region is some 40 miles from the railroad, the nearest point being Huntington, where the sparrows are abundant. To reach the ranches mentioned a mountain range must be crossed and long miles of sage plains and lava mesas, a region as little to their liking as a wood-yard to a tramp. It is more likely that they found their way up the valley from Ontario, some 70 miles, but through country that is entirely unsuited to the requirements of this species as we have regarded them in the past. The ranchers told me that they had not seen any sparrows until a month or so before, a statement that was likely true, since only small flocks were seen, and there was no evidence of their having been long resident.

In the spring of 1909 a pair of Bullock Orioles, migrating through the sage plains of eastern Oregon, paused to rest on the derrick of an oil well, several miles from the nearest tree or shrub, save the ever present Artemisia. The drill was temporarily idle and hanging from one of the timbers of the derrick was a frayed rope, resembling the end of a cow's tail. This was taken as a homestead and the nest hung from the loose fibers. Meantime an Arkansas Kingbird selected the end of the huge walking beam as a summer home and built. Before the eggs were hatched it became time to renew operations on the drill and the nests were in danger of destruction. The rope was cut and the end with the oriole's nest fastened to the corner of the derrick out of harm's way, while the Kingbird's nest was removed to a shelf some ten feet distant. Neither species objected in the least, and the young birds were raised amid the clatter of machinery and smoke of forge. In the spring of 1910 the kingbird returned and took possession of the same nesting site, but the rope had been removed and the oriole selected the branches of a sage-bush at the foot of the derrick, where the young were raised in a nest only two feet from the ground. — A. W. ANTHONY, *Portland, Oregon.*

Notes on Some Birds Rare or New to Wisconsin. In a neat little pamphlet of 51 pages, entitled "Birds of Oconto County," dated October 27, 1902, Mr. A. J. Schoenebeck of Kelley Brook, Wisc., gives a list of some 254 species, "identified, captured or seen" by him, most of which are in his collection. This list contains the first authentic record of the Water

Turkey (*Anhinga anhinga*) for Wisconsin, of which he says: " Rare visitant. One specimen brought to me in the spring of 1889; shot on the Green Bay shore, and proved to be a male."

A second authentic record of the Black Rail (*Creciscus jamaicensis*) is: " Summer resident; very rare. On June 9, 1899, I met with one of these little rails near the mouth of the Oconto River on the Green Bay shore, but could not discover its nest."

The Eskimo Curlew (*Numenius borealis*) is thus entered: " Migratory; rare. One specimen was brought to me April 27, 1899. This was shot near Oconto."

The Sharp-tailed Grouse is recorded as: " Visitant: rare. On Oct. 27, 1897, I shot an old male of this species near Peshtig's Brook." This is the first record for Wisconsin.

The Chestnut-collared Longspur (*Calcarius ornatus*) is given as " Resident; rare. The nest of this bird I have found twice on the northwest plains of this county." Not previously recorded from Wisconsin.— HENRY K. COALE, *Highland Park, Ill.*

Long Island Notes. SOLITARY SANDPIPER (*Totanus solitarius*).— On the 10th of May, at Flowerfield, L. I., I collected a splendid female of this species. Although this is not a rare record, I consider it a very interesting one because upon dissection I found that an egg in the ovaries was very well developed and three others had started to form. It looks as if this bird would have nested at or not far from place where taken.

BLACK-THROATED GREEN WARBLER (*Dendroica virens*).— This bird is a common summer resident at Flowerfield, L. I., where it breeds in the numerous cedar woods. Although I searched carefully during the breeding season I failed to locate a nest. I was just about to give up the search for 1910 when I saw a male fly into the top of one of the cedars, with something in its bill. After he had flown away the female also came with food, and upon looking carefully I saw a nestling perched on a twig near the top of the tree. The birds repeatedly fed this one and did not seem the least disturbed by my presence; further search disclosed two more nestlings.

SHORT-BILLED MARSH WREN (*Cistothorus stellaris*). I collected, at Floral Park, L. I., on October 18, 1910, a fine male of this species. He was among some goldenrod stubble in an open lot.— HENRY THURSTON, *Floral Park, L. I., N. Y.*

RECENT LITERATURE.

Swarth on the Birds and Mammals of the 1909 Alexander Alaska Expedition.[1]— The 1909 Alexander Expedition to parts of the Sitkan district of Alaska not visited by the expedition of 1907 was made by the author of the present paper, assisted by Allen E. Hasselborg of Juneau, during the period from April 1 to October 1, 1909, their means of transportation being a gasolene launch. Sixteen islands and six mainland localities were visited. The report contains a detailed itinerary and a large-scale map of the whole Sitkan district, as now commonly restricted. The material collected consists of 604 bird skins, and nearly as many specimens of mammals. The localities visited are described in detail, followed by a report on the birds (pp. 26–112), another on the mammals (pp. 113–151), and several pages entitled 'Distributional Considerations' (pp. 151–159). The list of birds numbers 137 species and subspecies, the mammals, 27 species and subspecies.

The report on the birds relates to "distribution, moult, variation, and biographical notes." The notes on habits and on the local distribution of the forms in the Sitkan district are often quite extended, as are frequently the notes on individual and seasonal variation. The report is thus an important contribution to the ornithology of the region. While no new forms are described, the material obtained is considered, as far as it goes, as generally confirmatory of the new local forms described by Grinnell in 1910, gathered during the Alexander expedition of 1908 to this same region. The conspecific relationship of *Macrorhamphus griseus* and *M. scolopaceus* is discussed at some length, the conclusion reached being that the two forms are only subspecifically distinct, as given in the last edition of the A. O. U. Check-List (not, however, cited in this connection). *Sphyrapicus ruber* is given as *S. varius ruber*. *Picoides americanus fumifrons* Grinnell is referred to *P. americanus americanus*, the second specimen of this supposed race having "not a trace of the smoky suffusion beneath" shown by the type. The breeding form of *Passerculus* is referred to *P. sandwichensis savanna*, "as a matter of convenience," since it more nearly resembles this eastern form than it does *P. s. alaudinus*. As Mr. Swarth has himself "seen no conclusive evidence" of the intergradation of *Junco hyemalis* and *J. hyemalis oreganus* (the "occasional specimens" combining the characters of both forms he would consider as hybrids), *oreganus* is given full specific rank. The long discredited *Hirundo erythrogaster* '*palmeri*' and *Dendroica coronata* '*hooveri*' are here revived, and the doubtfully identifiable name *gracilis* is given preference over *striata* for the western form of *Melospiza lincolni*.

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[1] Birds and Mammals of the 1909 Alexander Alaska Expedition. By Harry S. Swarth. University of California Publications in Zoölogy, Vol. VII, No. 2, pp. 9–172, pll. i–vi, 3 text-figs. January 12, 1911.

The climatic and physiographic conditions are said to be quite uniform throughout the area under consideration, and, with the exception of the grouse, "the avian fauna is everywhere much alike." In the case of the mammals, however, "it is interesting to note that with one or two possible exceptions there is no species of mammal that ranges unchanged throughout the whole of the region."— J. A. A.

Tracy's 'Significance of White Markings in Birds of the Order Passeriformes.'— The subject[1] is considered under the following captions: Intrinsic factors in the evolution of color; white markings as visual clues; the problem discussed for birds in the open; the problem discussed for arboreal species; special study of the Mniotiltidæ; sexual selection as affecting white patterns; directive markings outside the order Passeriformes; conclusions. The author has here assembled an interesting array of facts, and has discussed them in a liberal spirit. The Passeriform birds of North America are listed in groups with regard to whether they are birds of the open-ground or are arboreal, and are further subdivided with regard to their having or not having concealed white, or white wing and tail markings, etc. In birds of the open, nearly all those with white markings are "to be classed as flocking birds," while those without white marking do not flock, with a few exceptions, for which special explanations are offered.

"Coloration in birds," says the author, "whatever its cause or the mechanism of its production, is conceded to be adaptive; it responds to their needs, forms a part of their life adjustments. Concealment from its enemies is not the only need in a bird's life, not the only adjustment that affects color-patterns. The bird also needs to be made known to other individuals of its kind, and to other species associated with it; and this need has certainly been met.... The number and variety of perils that daily surround our smaller land-birds, and the extent to which these may be diminished by the birds' keeping in touch with one another, point to the need of something more than concealing coloration, and admit of special adaptations that shall act in harmony with it and yet serve to reveal the bird to its kind....

"Starting out with a presumption in favor of some form of revealing clues among the higher land-birds, and eliminating a terminology [banner-marks, etc.] which has been misleading, it remains for us to determine, if possible, what these clues are, and whether color features form a part of them; if so, how this harmonizes with the function of the same or similar color features as concealing.... But *general* coloration is seen to be normally protective, for birds that need protection; and as for special patterns, even a satisfactory demonstration of their 'obliterative' effect does not warrant the conclusion that such is solely or mainly their effect in all cases."

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[1] Significance of White Markings in Birds of the Order Passeriformes. By Henry Chester Tracy. University of California Publ., Zoöl., VI, No. 13, pp. 285–312. Dec. 28, 1910.

In the discussion of white markings that follows these general remarks, the conspicuousness and directive function of white markings that are concealed except in flight is insisted upon. The revealing function of white wing and tail markings "during flight is entirely in harmony with their concealing function when at rest." In Thayer's discussion of the "disruptive effects of color patterns," the author states that the "evidence here offered of their value as *revealing characters*, must not be regarded as contradicting anything but the application of the 'concealing' principle *to birds in flight*."

The following may be taken as the author's general summing of the evidence regarding coloration and environment: "With a preference for close, leafy coverts and secluded forest ways go the somberer tones, the monochrome coloration, shy, furtive habits. With a preference for open woods and roving ways, greater distances and separations to be adjusted, have come the greatest variety of top-patterns among birds, many of them showing excellent devices for a revealing flight from the opening wing." As a whole the paper is a welcome contribution of fact and discussion to a very interesting subject.— J. A. A.

Grinnell's 'American Game-Bird Shooting.' — Grinnell's 'American Game-Bird Shooting'[1] comprises three parts, treating respectively of 'American Game Birds,' in which the species and their habits are described (pp. 1–301); 'Upland Shooting' (pp. 303–507); and 'The Shooting of the Future' (pp. 511–558). The first part is ornithological, treating at length and in a very comprehensive manner of the habits and distribution of the Woodcock and Snipe, and the various species of Quail and Grouse of North America. For the purposes of the present book the author has "considered as game birds only the species that are commonly hunted with dogs," and it thus includes only those above indicated. The second part relates to the various methods employed in taking the birds, and such aids to shooting as dogs, guns, and ammunition. The third part comprises 'A Look Backward,' in which is historically set forth the great decline in the original abundance of game birds in this country and the causes that have produced it, and an account of the introduction of exotic game birds to replenish the havoc wrought through excessive destruction of native game birds. There is also an account of the efforts that have been made to restock exhausted covers and a plea for greater self-control on the part of gunners as an aid in promoting good shooting in the future.

Dr. Grinnell writes with the authority of one thoroughly master of his subject, and his 'American Game-Bird Shooting' may well interest a much wider circle than those who pursue birds with dogs and guns.—J. A. A.

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[1] American Game-Bird Shooting. By George Bird Grinnell. With colored plates of Ruffed Grouse and Bobwhite. 48 full-page portraits of Game Birds and Shooting Scenes, and many text cuts. New York: Forest and Stream Publishing Company. [Copyright, 1910.] 8vo, pp. xviii + 558. $2.50 net; postage, 25 cents.

Report of the Chief of the Bureau of Biological Survey for 1910.[1]—The report of the Chief of the Biological Survey, Mr. H. W. Henshaw, on the work of the Survey contains the usual summary of its activities for the fiscal year ended June 30, 1910. As is well known to readers of 'The Auk,' the resignation of Dr. C. Hart Merriam, for so many years the efficient director of this important Bureau, became effective June 1, 1910, and the Assistant Chief, Mr. H. W. Henshaw was promoted to the vacancy, with Dr. T. S. Palmer as Assistant Chief, Dr. Merriam still retaining an official connection with the Survey under the title of Consulting Biologist. The present report therefore deals mainly with the period preceding the change in administration.

In a document so condensed, and dealing with so many subjects of general interest, reference can here be made only to those more especially relating to ornithology. Investigations of the economic relations of birds and mammals to agriculture, of the geographic distribution of animals and plants with reference to the determination of the life and crop belts of the country, the supervision of matters relating to game preservation and protection, and the importation of foreign birds and animals, are the prescribed functions of the Survey under acts of Congress. Field work was conducted during the year in twelve different States, in continuation of that of previous years. The biological survey of Colorado and New Mexico is now practically completed and the final reports thereon are nearly ready for publication. It is stated that satisfactory progress has been made in digesting and putting into shape for easy reference the accumulated mass of information on mammals and birds, including a great amount of data on the migration and distribution of North American birds. Rapid advance has also been made in mapping the distribution of both birds and mammals. A revised edition of a general zone map of the United States is also in preparation.

Under the head of National Bird Reservations, which number 51, divided into six districts, it is said: "Experiments in marking birds with bands to determine the course of migration were initiated on the Stump Lake (N. Dak.) and Klamath Lake (Oreg.) reservations, and investigations to determine the homing instinct and the power of birds to find their way back to the breeding grounds, begun by Prof. J. B. Watson in 1907 on the Tortugas (Fla.) reservation, under the direction of the Carnegie Institution, were continued in the spring of 1910."

Game protection, illegal traffic in game, coöperation in game protection with State authorities, the supervision of the importation of foreign birds and animals, investigation of the food habits of ducks, the relation of birds to insect pests and the fruit industry, are among the numerous subjects treated in the Report, but perhaps of even greater importance are the investigation of ground squirrels and wood rats in their relation to the dissemination of the spotted fever and the bubonic plague, and of means to reduce their number, and, where necessary, to effect their extermination. The scope and efficiency of the work of the Survey is thus extended year by year to meet new emergencies and conditions; its work along economic lines is thus of the highest importance to the general welfare, in addition to its biologic phases.— J. A. A.

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[1] Reprinted from Annual Reports of the Department of Agriculture, 1910. 8vo, pp. 19. Washington, Government Printing Office, 1910.

Jacobs on the Purple Martin and Houses for its Summer Home.— Mr. J. Warren Jacobs contributes further welcome information [1] regarding his success in supplying houses for the summer homes of the Purple Martin. This brochure of 38 pages contains a list of persons who have put up his martin houses, with many reports from correspondents concerning the success that has attended their use. These reports are followed by several pages "On Snakes as Bird Destroyers, and their Power to 'Charm.'" From the statements here made it is evident that snakes are quite destructive to not only the eggs and young of birds that nest on the ground, but also to those nesting in bushes and trees, and that even Martins nesting in bird houses are not wholly exempt from their attacks.— J. A. A.

'**How to Attract and Protect Wild Birds.**'— This second English edition of Hiesemann's well known work [2] presents many new features and shows that there is a large demand for the English version of this very useful and excellent manual of how to attract and how to promote the increase of wild birds, as well as how to protect them from natural enemies, based on the well-known devices and experiments made during many years of close study of the subject by Baron von Berlepsch on his estate at Seebach, Germany. The legal aspect of bird protection is not treated; protection here means the provision of nesting-places for birds that breed not only in holes in trees and in sheltered niches, but also for those that breed in the open, as in fields and marshes, and in thickets and woods. Protection, in other words, means the preservation, so far as possible, of natural conditions and haunts, as well as the erection of artificial nesting-sites. A chapter is devoted to the feeding of birds in winter, and the various methods employed are illustrated as well as described.

The author refers to the principle of utilitarianism that is now so widespread among all classes of society, but has the courage to say: "We do not protect birds solely because they are useful, but chiefly from ethical and æsthetical reasons, as birds give beauty and animation to nature. We also wish to preserve their species, and hence the protection of birds signifies the preservation of the monuments of Nature." The very full and reasonable instructions here given would be of great service to those in any country who are willing to make a little effort for the preservation and increase of birds, and it is thus fortunate that the National Association of Audubon Societies is an agency for the sale of the work in America.— J. A. A.

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[1] Second Supplement to Gleanings No. 5. The Purple Martin (*Progne subis subis*) and Houses for its Summer Home. By J. Warren Jacobs. Waynesburg, Pa. Issued November 1, 1910. 8vo. pp. 57–94, with halftone illustrations.

[2] How to | Attract and Protect | Wild Birds | By | Martin Hiesemann | Translated by | Emma S. Buchheim | With an Introduction by | Her Grace the Duchess of Bedford | Second edition with many revisions | With many illustrations London | Witherby & Co. 326 High Holborn | 1911. 8vo. pp. 100. 40 text figures. 1s. 6d. net. Can also be ordered of the National Association of Audubon Societies, 1974 Broadway, New York City. (Note the change of address.)

Economic Ornithology in recent Entomological Publications.— The oak pruner (*Elaphidon villosum*), a longicorn beetle that seriously injures oaks, hickories, peach and pear trees, is the subject of a recent circular of the Bureau of Entomology.[1] The author, Dr. F. H. Chittenden, says: "Among natural enemies of the oak pruner, Mr. F. H. Mosher records the Downy Woodpecker (*Dryobates pubescens*), the Blue Jay (*Cyanocitta cristata*), and the Black-capped Chickadee (*Penthestes atricapillus*). Mr. W. L. McAtee of the Bureau of Biological Survey, states that a species of *Elaphidion* is preyed upon by the Downy Woodpecker and by the Great-crested Flycatcher (*Myiarchus crinitus*)." Dr. Chittendon has also recently published an account[2] of the wild bird enemies of the potato beetle (*Leptinotarsa decemlineata*) in which the Chipping Sparrow receives fullest mention. Four species not recorded by Dr. Chittenden are the Starling, Chewink, Cliff Swallow, and Cedarbird, the complete list being: Bobwhite, Prairie Chicken, Sharp-tailed and Ruffed Grouse, Red-tailed Hawk, Nighthawk, Yellow-billed Cuckoo, Crow, Starling, English Sparrow, Chipping Sparrow, Chewink, Cardinal, Rose-breasted Grosbeak, Scarlet Tanager, Cliff Swallow, Cedarbird, Wood, Hermit and Olive-backed Thrushes, and Robin.

The writer of 'The Life History and Control of the Hop Flea-Beetle,'[3] the subject of which is a chrysomelid beetle which has destroyed 75 percent of the crop in some seasons in certain parts of British Columbia, thinks it possible that the insect has some bird enemies, but mentions none. Biological Survey records furnish the names of two, the Killdeer (*Oxyechus vociferus*) and the Cliff Swallow (*Petrochelidon lunifrons*).

A few paragraphs in the Report on the Field Work against the gipsy moth and the brown-tail moth[5] shows that interest in the bird enemies of these pests is unabated. As there has been but one[4] complete list of the bird enemies of the gipsy moth published since the original report by Forbush and Fernald in 1896 and none complete for the brown-tail,[6] revised lists will not be out of place in the present connection.

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[1] Circular 130, Bur. Ent., Dec., 1910, p. 7.

[2] Bull. 82, Pt. VII, Bur. Ent., Feb. 1911, p. 87.

[3] Parker, W. B., Bull. 82, Pt. IV, Bur. Ent., May, 1910, p. 48.

[4] Forbush, E. H., Massachusetts Crop Report, July, 1900, pp. 33, 34.

[5] Bull. 87, Bur. Ent., Aug., 1910, pp. 26–27.

[6] The Gypsy Moth. Massachusetts State Bd. Agr., Boston, 1896, pp. 207–208.

The following list is made to show the number of known bird enemies of both the gipsy and brown-tail moths, by prefixing the initials G and B respectively before the names of birds to which these credits are due. Forty-six birds receive the G and thirty-one the B.

G	B	Yellow-billed Cuckoo	*Coccyzus americanus*
G	B	Black-billed Cuckoo	*Coccyzus erythrophthalmus*
	G	Hairy Woodpecker	*Dryobates villosus*
	G	Downy Woodpecker	*Dryobates pubescens*
	G	Yellow-bellied Sapsucker	*Sphyrapicus varius*
	G	Flicker	*Colaptes auratus*
G	B	Kingbird	*Tyrannus tyrannus*
G	B	Great-crested Flycatcher	*Myiarchus crinitus*
	G	Phœbe	*Sayornis phœbe*
	G	Wood Pewee	*Myiochanes virens*
G	B	Least Flycatcher	*Empidonax minimus*
G	B	Blue Jay	*Cyanocitta cristata*
G	B	Crow	*Corvus brachyrhynchos*
G	B	Red-winged Blackbird	*Agelaius phœniceus*
G	B	Baltimore Oriole	*Icterus galbula*
G	B	Crow Blackbird	*Quiscalus quiscula*
G	B	English Sparrow	*Passer domesticus*
G	B	Chipping Sparrow	*Spizella passerina*
	B	Field Sparrow	*Spizella pusilla*
G	B	Song Sparrow	*Melospiza melodia*
	G	Chewink	*Pipilo erythrophthalmus*
G	B	Rose-breasted Grosbeak	*Zamelodia ludoviciana*
G	B	Indigo Bunting	*Passerina cyanea*
G	B	Scarlet Tanager	*Piranga erythromelas*
G	B	Red-eyed Vireo	*Vireosylva olivacea*
G	B	Yellow-throated Vireo	*Lanivireo flavifrons*
	G	White-eyed Vireo	*Lanivireo griseus*
	B	Warbling Vireo	*Vireo gilvus*
G	B	Black and White Warbler	*Mniotilta varia*
G	B	Golden-winged Warbler	*Vermivora chrysoptera*
G	B	Nashville Warbler	*Vermivora rubricapilla*
	G	Parula Warbler	*Compsothlypis americana*
G	B	Yellow Warbler	*Dendroica æstiva*
G	B	Chestnut-sided Warbler	*Dendroica pensylvanica*
	G	Black-throated Green Warbler	*Dendroica virens*
	G	Oven-bird	*Seiurus aurocapillus*
	G	Maryland Yellow-throat	*Geothlypis trichas*
G	B	Redstart	*Setophaga ruticilla*
G	B	Catbird	*Dumetella carolinensis*
	G	Brown Thrasher	*Toxostoma rufum*
	G	House Wren	*Troglodytes aëdon*
	G	White-breasted Nuthatch	*Sitta carolinensis*

	G	Red-breasted Nuthatch	*Sitta canadensis*
G	B	Chickadee	*Penthestes atricapillus*
G	B	Veery	*Hylocichla fuscescens*
G	B	Wood Thrush	*Hylocichla mustelina*
G	B	Robin	*Planesticus migratorius*
	G	Bluebird	*Sialia sialis*

Messrs. Rogers and Burgess, authors of the report on the gipsy and brown-tail moths, note that "A few species, among which may be mentioned the Crow, while destroying many of the larvæ, undoubtedly aid the spread of the gipsy moth by dropping live caterpillars in uninfested sections." The subject of the distribution of the moth by birds has nowhere received as full consideration as in the original report referred to above (pp. 235–240). It is recorded there that the Wood Thrush, Chickadee, and Least Flycatcher were seen to drop caterpillars or female gipsy moths from their beaks, and that a young Baltimore Oriole refused a larva which the parent bird brought, dropping it over the side of the nest. Circumstantial evidence points to the formation of new colonies about Crow's nests.

The authors, Messrs. Forbush and Fernald, remark that "A bird may overlook a few caterpillars near its nest, preferring to go where caterpillars are plentiful rather than to search for them where they are scarce. It is probable, then, that the bird which is most useful in destroying caterpillars and which feeds the largest number to its young will be the most likely to aid in the distribution of the moth. The danger of distribution would probably be greater in the case of the larger species of birds, were it not that a caterpillar seized in the bill of a Crow would be more likely to be seriously injured than one taken in the bill of a small bird. The danger of distribution to distances of much more than half a mile by birds in this way does not seem to be great.... The distribution of caterpillars by birds goes to prove the rule that nature does not usually work for the extermination of species. While the birds are very useful as assistants in the work of extermination by destroying the gypsy moths, they hinder the work to some extent by distributing the larvæ and the female moths.

"No appreciable distribution of caterpillars by birds will occur, however, except when caterpillars are present in large numbers, for then only will birds go to a distance to secure caterpillars as food for their young. Probably no other form of dissemination of caterpillars by birds will materially extend the moth's distribution even under the most favorable conditions. Whenever the caterpillars are present in large numbers in a settled country, they will be carried much farther and scattered abroad more widely by man and domestic animals than by birds. In woodlands remote from civilization, birds may be the principal factor in diffusing the moth to a short distance from badly infested spots, but the distribution of the moth in such places is not of so much moment as in cultivated and settled regions. If the moth were allowed to increase and spread over the whole State, we may infer that all possible distribution by birds would be of little importance as compared with the good they would do in checking the increase of the moth."

The question as to distribution of gipsy moth eggs by birds has recently been revived and as a coincidence by two independent investigators whose results were published in the August issues of different entomological journals.[1] Both of these articles deal with experimental feedings of caged birds. Mr. William Reiff used the European Yellow-Hammer, Chaffinch, Canary and Carrier Pigeon, the Japanese Robin, and one native species, the Screech Owl. The moth eggs were mixed with or placed within other food before they were given to the birds. The Canary and the Chaffinch picked out and rejected most of the eggs, but a few that passed through the alimentary canal of the former failed to hatch. Twelve eggs passed by the Yellow-hammer likewise failed to hatch. Three out of 52 eggs passed by the Japanese Robin hatched. Of 120 eggs concealed in the abdomen of a mouse which was fed to a Screech Owl, 112 came through the alimentary canal of the bird. Seven of these hatched. None of the eggs fed to the Carrier Pigeon were found in the excrement. The writer concludes that "Gypsy moth eggs can withstand the action of digestive fluids of birds belonging to at least two families, Turdidæ and Bubonidæ, without suffering any, or only slight, injury. In regard to the family, Fringillidæ, also an insectivorous group," he says, "I am inclined to believe that these birds might also occasionally distribute gypsy moth eggs in spite of the negative results obtained in my experiments. Since the members of the pigeon family grind up their food in a gizzard filled with small stones it is very unlikely that gypsy moth eggs could pass through their intestines without being destroyed."

These conclusions are too sweeping; it would have been better to have said that the eggs can sometimes withstand the action of digestive fluids or that they have been shown to do so in a few cases under experimental conditions. The conclusion regarding sparrows has no justification in the experiments reported. Objections to this paper which apply equally the one discussed below will be united with comments on that article.

Mr. C. W. Collins experimented with English Sparrows and a pigeon. The writer says: "The sparrow was chosen.... mainly because it has been known to feed upon the eggs in confinement; the pigeon, merely to determine if the eggs would be digested. In all cases it was necessary to force the birds to eat them." In the case of the English Sparrows this was done by putting the eggs well into the mouth by means of a toothpick; and a mixture of dough and eggs was forced into the pigeon's beak. Three of the sparrows were confined in small boxes, and the ten used in the experiments lived on the average only about 34 hours after capture. "Approximately 356 *P. dispar* eggs were fed to the last three sparrows. One hundred and forty-two of these eggs or 40 per cent. were found intact in the excrement. Seven of the 356 (2 per cent) or 5 per cent of the 142 that were passed intact hatched. One hundred and thirty-five or 38 per cent was the approximate number found to be digested or partly so." The excrement of the pigeon contained no intact eggs.

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[1] Reiff, W., Some Experiments on the Resistance of Gypsy Moth Eggs to the Digestive Fluids of Birds. Psyche, XVII, 1910, pp. 161-164

Collins, C. W., Some Results From Feeding Eggs of *Porthetria dispar* to Birds. Journ. Ec. Ent., III, 1910, pp. 343-346.

The writer admits that the "experiments were conducted under abnormal conditions. The birds were not only forced to swallow the food, but were deprived of their freedom, which is essential to rapid and vigorous digestion." We would add that it would have been much better to have selected for experiment birds such as Chickadees that are known habitually to feed upon lepidopterous eggs. Observations on these birds in a roomy cage and with choice of a variety of food, including gipsy moth eggs, might furnish some data having a bearing on the natural distribution of the eggs.

But experiments upon an owl and such preëminently granivorous species as the fringilline birds and pigeons, especially when these birds are very closely confined and have their few last mouthfuls of food, in which gipsy moth eggs are concealed, forced upon them, depart too far from natural conditions. So abnormal were both sets of experiments that it is doubtful if the results shed any light on the distribution of gipsy moth eggs by genuine egg-eating birds in the state of nature.

One other entomological paper to which we wish to draw attention also deals with insect eggs. This is Mr. Henry H. P. Severin's 'Study on the Structure of the Egg of the Walking-Stick *Diapheromera femorata* Say, and the Biological Significance of the Resemblance of Phasmid Eggs to Seeds."[1] The writer says: "Sharp in all the species which he has examined believes that these resemblances in the eggs have no bionomic importance for the species and I am strongly inclined to accept his view in the case of the egg of *Diapheromera femorata*." This statement is very welcome to economic ornithologists, who have suffered long, though chiefly in silence, from the deluge of theoretical essays on the supposed relations of birds to mimicry and kindred phenomena among insects.

Mr. E. G. Titus is the author of an interesting bulletin of the Utah Experiment Station[2] dealing with the alfalfa leaf-weevil (*Phytonomus murinus*), a pest of foreign origin recently introduced and doing immense damage in the State. Some attention was paid to natural enemies, and it is said that "wild birds do not appear to relish the weevil, or perhaps they have not become accustomed to its presence." Twenty out of 80 English Sparrows shot in alfalfa fields had eaten the weevil. One Black-headed Grosbeak was collected and found to have eaten the weevil. These results do not warrant the statement made in this Bulletin and elsewhere that "wild birds do not appear to relish the weevil," for really only one bird was examined that could be reasonably expected to feed extensively on the insect, and its stomach contained remains of some of the pests. Judging from the fondness of birds for the clover leaf weevil (*Phytonomus punctatus*) and other species of the genus, a large number of birds will probably be found to prey upon the alfalfa weevil.— W. L. M.

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[1] Ann. Ent. Soc. Am., III, 1910, pp. 83–92.

[2] Bull. 110, 1910, pp. 19–72.

Corrections and Additions to January Installment of Economic Ornithology.— In the list of mosquito-eating birds on p. 141 of the January, 1911, Auk is included the Whip-poor-will (*Antrostomus "carolinensis"*). The specific name should of course be *vociferus*. On the authority of Jas. H. Gaut, formerly of the Biological Survey, the name of the Northern Violet-green Swallow (*Tachycineta t. lepida*) may be added to this list. The writer has recently found mosquitos in the gizzard of a Mallard (*Anas platyrhynchos*).

Three additional species also are noted in Bulletin 3 of the West Virginia Experiment Station; but the correctness of these records is said to be open to question.

An additional reference to tick-eating birds is Auk, XXIV, 1907, p. 401, where E. S. Cameron states that the Brewer Blackbird (*Euphagus cyanocephalus*), the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), and the Red-winged Blackbird (*Agelaius phœniceus arctolegus*) feed upon sheep ticks in Montana. A newly discovered enemy of the Texas-fever tick is the Fish Crow (*Corvus ossifragus*).— W. L. M.

Faxon on Brewster's Warbler.[1]— This paper is a most important contribution to our knowledge of Brewster's, or the White-throated Warbler, *Helminthophila leucobronchialis*, and practically settles the question whether this is a hybrid or a legitimate species. It is a record of a series of observations made on three families of warblers during the summer of 1910.

In two cases the male birds were Golden-winged Warblers and the females Brewster's Warblers; in the third instance both parents were Golden-wings; the young of the first two pairs lacked the clear markings of the Golden-wing, the young of the third pair were unmistakable Golden-wings. The detailed observations on the three families just noted are followed by a statement and discussion of the various hypotheses advanced as to the status of Brewster's Warbler, some sixteen cases being reviewed briefly. Finally the known facts are viewed in the light of Mendel's Law, the inference from this, and from the known facts being that Brewster's Warbler is a hybrid between *Helminthophila pinus* and *H. chrysoptera*, a deduction quite in keeping with the fact that no instance is known of a mated pair of Brewster's Warbler.

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[1] **Brewster's Warbler. By Walter Faxon. Memoirs of the Museum of Comparative Zoölogy at Harvard College, Vol. XL, No. 2, pp. 57–78, with one colored plate (to be supplied).**

If the information gained is important, the manner in which it is imparted is somewhat exasperating to one unacquainted with previous papers on the subject. The title of the memoir affords no clue to its import; there is no statement of the problem under consideration, and for the first ten pages there is nothing to hint that there is any question as to the specific validity of the bird under consideration; furthermore in no instance do the common and scientific names occur in conjunction. Nevertheless we are much indebted to Mr. Faxon for the memoir.— F. A. L.

'**Cassinia.**'[1] — The present issue contains a biographical sketch of Dr. William Gambel, by Witmer Stone; an 'Unpublished poem by Alexander Wilson,' by Robt. P. Sharples; 'Breeding of the Raven in Pennsylvania,' by Richard C. Harlow; 'The Wood Thrush,' by Cornelius Weygant; 'Nesting of the Blackburnian Warbler in Pike Co., Pa.,' by David E. Harrower; 'Recollections of Wild Pigeons in Southeastern Pennsylvania, 1864–1881,' by John G. Dillin; 'Report on the Spring Migration of 1910,' by Witmer Stone; the usual 'Abstract of Proceedings of the Delaware Valley Ornithological Club for 1910'; 'Bibliography for 1910' of papers relating to the birds of Pennsylvania, New Jersey and Delaware, and the usual 'Bird Club Notes' and list of officers and members. The frontispiece is a view of the building occupied by the Academy of Natural Sciences of Philadelphia from 1826–1840, at the corner of Twentieth and Sansom Streets, Philadelphia.

Mr. Stone's biographical sketch of Dr. William Gambel, well known to ornithologists through the various species of North American birds associated with his name, as described by him or named in his honor, presents the little that is known of his personal history. He is supposed to have been born "somewhere in eastern Pennsylvania or southern New Jersey, and to have early attracted the attention of Thomas Nuttall"; but his actual place of birth appears to be unknown, nor is anything known to Mr. Stone of his family history or of his relatives, nor has he been able to find a portrait of this distinguished pioneer in ornithological research in the wilds of the far West. From Mr. Stone's sketch we learn that he was employed for a short time at the Philadelphia Academy of Natural Sciences, and in 1847 was a candidate for the curatorship, but was defeated by the late Dr. Joseph Leidy. He served, however, as Recording Secretary in 1848–49, and on the Publication Committee, 1845–49. When little more than twenty-one years of age he made an overland trip to California, returning by way of Valparaiso and Cape Horn to Philadelphia in 1845. On this trip he secured the various new species of North American birds described by him soon after his return. In the winter of 1845 he began the study of medicine, obtaining his medical degree in 1848. In April, 1849, he started on a second overland journey to the Pacific coast, leaving Independence, Missouri, May 1, having joined "a Virginia Company of five men, one wagon and eight mules." On June 2 the party overtook a large ox-train on the Platte River, under the command of Captain Boone of Kentucky, which Gambel joined in the capacity of medical assistant. After many months of hardship, Boone's train reached the Sierra, where heavy falls of snow compelled the abandonment of the cattle and wagons, and the men endeavored to cross the mountains with such provisions as they could carry. Most of them perished, "but Boone, Gambel, and a few others succeeded in making their way to Rose's Bar on Feather River," in what is now Plumas County, California. Here, on December 13, 1850, Gambel died of typhoid fever, at the early age of about thirty years.— J. A. A.

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[1] Cassinia. A Bird-Annual: Proceedings of the Delaware Valley Ornithological Club of Philadelphia. No. XIV. 1910. 8vo, pp. 61, and frontispiece, March, 1911.

Mathews's 'Birds of Australia.' — Part 2[1] of this great work completes the Turnicidæ and includes the Treronidæ and part of the Columbidæ. In this part fourteen species are figured and described, and both text and plates conform to the high standard set in Part 1, noticed in detail in the January issue of this journal.— J. A. A.

McGee's 'Notes on the Passenger Pigeon.' — In the issue of 'Science' for December 30, 1910, Dr. McGee, in an article of five and a half pages,[2] gives his recollections of the Passenger Pigeon as observed by him in eastern Iowa "in the sixties and early seventies," and of other pigeons he mistook for this species in 1905 in the "Sierra Gila, seventy-five miles southwest of Yuma and near the Mexican boundary." His recollections of Passenger Pigeons in Iowa form a welcome addition to the reminiscences of a species now probably extinct as a wild bird, but the Arizona notes are unfortunately based on an evident misidentification of a species known locally in the arid Southwest as the "Sonora Pigeon." Although his account of its habits and appearance is detailed, and in some ways conforms to the characters of the Passenger Pigeon, no specimens were saved for positive identification, and in the light of our present knowledge of the habits and range of this species doubtless few ornithologists will be willing to accept his record of the Passenger Pigeon in arid southwestern Arizona as a valid record for the species without the confirmation of actual specimens from the region in question. The pros and cons of the case were considered in a later issue of 'Science.'[3] — J. A. A.

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[1] Birds of Australia. By Gregory M. Mathews. Part 2, January 31, 1911. Royal 4to, pp. 97–136, pll. xxii–xxxv, colored. Witherby & Co., London.

[2] For full title and conditions of publication see the notice of Part 1, *antea*, pp. 135, 136.

Notes on the Passenger Pigeon. By W J McGee. Science, N. S., Vol. XXXII, pp. 958–964, December 30, 1910.

[3] The Arizona 'Passenger Pigeons'. By J. A. Allen. Science, Vol. XXXIII, pp. 217–219, February 10, 1911.

Publications Received.— **Allen**, J. A. (1) The Arizona 'Passenger Pigeons.' (Science, N. S., XXXIII, No. 841, pp. 217–219, Feb. 10, 1911. (2) *Columbina* vs. *Chæmepelia*. (*Ibid.*, No. 844, pp. 336, 337, March 3, 1911.)

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Tracy, Henry Chester. Significance of White Markings in Birds of the Order Passeriformes. (Univ. California Publ. in Zoölogy, VI, No. 13, pp. 285–312. Dec. 28, 1910.)

Zimmer, John T. Some Notes on the Winter Birds of Dawes County, Nebraska. (Proc. Nebraska Orn. Union, V, No. 2, 1911.)

Annals of Scottish Nat. Hist., No. 77, Jan., 1911.

Aquila, XVII, 1910.

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Bulletin British Orn. Club, Nos. CLXV–CLXVII. 1911.

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Cassinia, No. XIV, 1910 (March, 1911).

Condor, The, XIII, Nos. 1–3, Jan.–March, 1911.

Emu, The, X, Part 3, Dec., 1910, Part 4, Jan., 1911.

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Messager Ornithologique, I, No. 14, 1910.

Ornithologisch Monatsberichte, Nos. 1–3, Jan.–March, 1911.

Ornithologische Monatsschrift, XXXV, Nos. 11 and 12, 1910, XXXVI, No. 1, 1911.

Ornithologisches Jahrbuch, XXI, Heft 4.

Ottawa Naturalist, XXIV, Nos. 10–12, 1911.

Proceedings Acad. Nat. Sci. Philadelphia, LXII, Pt. 3, Oct.–Dec., 1910.

Proceedings California Acad. Sci., (4) I, pp. 7–288, Jan. 20, 1911.

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Science, N. S., XXXIII, Nos. 836–847, 1911.
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Zoölogical Society of London, Abst. of Proc., Nos. 89–92, 1911.
Zoölogist, The, (4) XV, Jan.–March, 1911.

NOTES AND NEWS.

George Ernest Shelly, a Corresponding Fellow of the American Ornithologists' Union, died in London, November 29, 1910. A notice of his life and works will be given in a later number of this journal.

In the biographical notice of Manly Hardy, published in the January number of this journal (Auk, XXVIII, 1911, p. 150), he is said to have been elected an Associate Member of the American Ornithologists' Union at its first meeting held in 1883, and that "he retained this membership till 1901." By an unfortunate inadvertence the important fact that he was then transferred to the newly established class of Members was not mentioned. He was not only one of the first to be elected to this class, but remained an honored member of it till his decease.

The Audubon Society of the State of New York held its Fourteenth Annual Meeting at the American Museum of Natural History, March 16, 1911. In the absence of the President of the Society, Prof. Henry Fairfield Osborn, Dr. F. A. Lucas presided. The report of the Secretary-Treasurer, Miss Emma H. Lockwood, showed that the past year had been one of unusual activity in the prosecution of its work. Mr. T. Gilbert Pearson, Secretary of the National Association of Audubon Societies, presented a report on current legislation, with particular reference to bills to amend the present bird laws now before the New York Legislature, in order to make the present laws less efficient in behalf of the millinery interests, market hunters, and cold-storage dealers in game. Mr. Herbert K. Job gave an illustrated address on 'Bird Hunting with a Camera.'

The National Association of Audubon Societies, having found its old quarters at 141 Broadway, New York City, too cramped for its activities, has moved further up town, having taken rooms at 1974 Broadway, near the corner of 67th Street. Here much more commodious rooms have been secured at less cost, and at a point convenient of access from any part of the city. Correspondents of the National Association and intending visitors to its headquarters should carefully make note of the change of address to **1974 Broadway**, near the subway and elevated railway stations at 66th Street and Broadway, New York City.

Mr. Frank M. Chapman, curator of birds at the American Museum of Natural History, sailed from New York on March 13 for several months of field work in western Colombia, in the interest of the American Museum.

In addition to the general collecting of birds and mammals, he will secure materials for a series of habitat groups of characteristic forms of tropical bird life. He took with him from New York Mr. Louis Agassiz Fuertes, the well-known bird artist, and Mr. Leo E. Miller of Indianapolis, Ind., as assistants, and will be joined in the field by Mr. W. B. Richardson, who in recent years has made large collections of birds and mammals, in Nicaragua for the American Museum, and who for the last four months has been in the field in western Colombia. The party expected to land at Buenaventura about March 25, and proceeding inland by way of San Antonio, establishing headquarters later at Cali, in the Cauca Valley, and, if time permits, visiting Quito, and returning by way of Guayaquil.

Mr. A. C. Bent, of Taunton, Mass., is organizing an expedition to the Aleutian Islands for the purpose of making a thorough biological survey of that interesting region, covering practically the whole of the summer season. Negotiations are now on foot to secure the use of a Revenue cutter to take the party, which will consist of three scientific men in addition to Mr. Bent. Mr. Rollo H. Beck, well known for his work in the Galapagos Islands and along the coast of California, has already been engaged, and it is probable that the United States National Museum and the Biological Survey will each send a representative.

The expedition will probably start in May, beginning work at Attu Island, the westernmost of the Near Islands, and proceeding slowly eastward during the summer, will visit and thoroughly explore all of the important islands of the Aleutian chain, and possibly visit some of the islands in Bering Sea. The expedition will be fully equipped to take photographs, and to collect mammals, birds, plants, and other natural history material.

Through coöperation between the American Museum of Natural History and the United States Bureau of Fisheries the steamer 'Albatross' sailed from San Diego, California, on a two months' collecting trip and survey of the fishery resources of the waters about Lower California. The expedition is under the direction of Dr. Charles H. Townsend, Acting Director of the American Museum, who is supported by able assistants selected expressly for the work to be undertaken. This will consist of deep-sea dredging, a fishery survey of the coasts of the peninsula, and land collecting at frequent points from San Diego southward, particularly for birds and mammals.

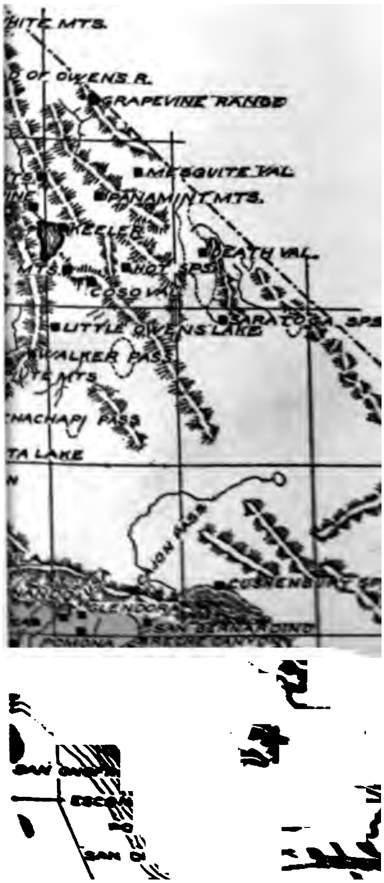
Dr. Townsend has the advantage of previous familiarity with most of the points to be visited, and can thus wisely select the localities for the shore parties, which will be transferred frequently from point to point. A line of deep-sea dredgings was first run to Guadaloupe Island, and the success of the trip to Guadaloupe has been demonstrated by the recent arrival at the Aquarium in New York of six young elephant seals taken there, while skeletons and skins of others, including adults, were secured for the American Museum.

Doubtless the work of the expedition will add materially to our knowledge of the fauna and flora of Lower California.

STRIBUTION
of the
MOCK NGBIRD
gottos leucopterus (Vig
IN CALIFORNIA

■ RECORD STATION

ED AREA IS THAT OF ASSUMED
TANT AND COMMON RESIDENCE



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DISTRIBUTION OF THE MOCKINGBIRD IN CALIFORNIA.

BY JOSEPH GRINNELL.[1]

With map.

PROBABLY the passerine bird most favorably and extensively known to the people of California is the Western Mockingbird (*Mimus polyglottos leucopterus*). This species has earned its reputation by its song of extraordinary loudness and persistency, so that more than any other native bird of the same habitat has it impressed its hearers with its presence. The occurrence of the Mockingbird is associated in the popular mind with the orange groves of southern California. The following distributional study shows this idea to be based upon a good deal of fact.

The northernmost known occurrence of the Mockingbird in California is in the upper Sacramento Valley, a little below the 40th parallel of latitude: An individual is recorded as having been observed at Chico, Butte County, February 10, 1884 (Belding, Land Birds Pac. Dist., Sept., 1890, p. 226). Next south of this point its presence has been noted at Gridley, Butte County, July 22, 1885 (Belding, l. c.). At Marysville, Yuba County, and Marysville Buttes, Sutter County, the Mockingbird was formerly found nesting (Belding, Proc. U. S. Nat. Mus., I, 1879, p. 396; Belding, Land Birds Pac. Dist., Sept., 1890, p. 226). The above four records are all we have from the Sacramento Valley, and since recent inquiry of persons living in that region has failed to elicit positive evidence of its occurrence there at the present time, it is fair to conclude that the species has not found the conditions sufficiently congenial to bring about its establishment there as a regular component of the avifauna. (See Map.)

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[1] A contribution from the Museum of Vertebrate Zoölogy of the University of California.

Continuing to the southward in central California, Stockton is the next record station. Here the bird has been observed in both winter and summer, though in small numbers (Belding, l. c.). In the foothills of Calaveras County (Big Trees and Copperopolis) it has been noted rarely (Belding, l. c.). From the vicinity of Merced south through the San Joaquin Valley to the region about Bakersfield, the Mockingbird is well known as a common resident and breeding species in favorable places; and as the plains are being reclaimed for orchards and ranches, the range of the Mockingbird is enlarging and covering the region more continuously. On the east side of the valley, next to the foothills, the conditions are apparently most favorable. This general information has been gathered from several separate and reliable sources.

While record stations would appear to show a continuity of breeding range from the San Joaquin area through the Tehachapi and Walker passes to the Mojave Desert, it is not at all certain that this is the case. It is not apparent from the literature at hand whether records are of birds actually nesting, or of mere stragglers. If the latter, their significance is not important in this connection.

It is quite certain that portions of the breeding range of the Mockingbird, even within California, are wholly disconnected from others. This is obviously true in the case of Santa Cruz, Santa Catalina and San Clemente Islands, on each of which the species is known to breed. Although occurring on these islands in winter as well as in summer, it is not safe to assert that individuals do not pass back and forth between islands, and from the islands to the mainland. This crossing is certainly but little less to be expected than the apparent wintering on the Mojave and Colorado deserts of individuals which summer a hundred or more miles distant in the Panamint and adjacent mountains. No differences have been detected between specimens of the Mockingbird from different portions of its range in California, even those from the islands being indistinguishable from examples from the San Diegan district and from the deserts.

The distribution of the Mockingbird *east* of the Sierran divide is evidently modified more by season than is the case anywhere on the Pacific slope of California. It would appear from a consideration of all the records of the species so far available that it occurs in summer chiefly if not altogether on the slopes of the mountains, dropping into the adjacent valleys in winter, and at that season even extending, in small numbers, by a veritable migratory movement, south over the Mojave Desert.

The northernmost record east of the Sierras is from the heads of Owens River and Owens Valley, about latitude 37° 40′ (Fisher, N. Am. Fauna, No. 7, May, 1893, p. 127). Thence south through Owens Valley and along the ranges to the eastward there are a number of summer records. Though observed in Death Valley in January and April, not a single one was found there in June (Fisher, l. c.).

No positive information is at hand indicating that the species breeds in the lowest and hottest parts of the southwestern deserts, where, however, it occurs in winter. Exploration along the valley of the lower Colorado River by the expedition of the Museum of Vertebrate Zoölogy in 1910 showed the Mockingbird to be common there from February to April; but there were no indications that the individuals were about to nest in the region. On the contrary everything pointed towards their being winter visitants from a breeding area elsewhere.

The only record-station in the coast region north of San Francisco Bay is San Geronimo, Marin County. Mailliard (Auk, XV, April, 1898, p. 197) records a male specimen taken there December 30, 1894. In the coast region south of San Francisco Bay, beginning at the north, we have the following records. Redwood City: specimen taken September 5, 1891; "rarely seen here; I have met with but three others during the past twenty-five years" (Littlejohn, Zoe, III, Jan., 1893, p. 362). Stanford University: male specimen secured February 17, 1893 (Van Denburgh, Proc. Am. Philos. Soc., XXXVIII, Nov., 1899, p. 177); individual seen December 20, 1904, and "for a week or two subsequently" (Fisher, Condor, VII, March, 1905, p. 55). Haywards, Alameda County:

November 28, 1888, and for a month or so thereafter, one individual; October, 1894, to April, 1895, one individual continuously; November, 1895, one individual; November 2, 1896, to spring of 1897, one individual all winter (Emerson, Bull. Cooper Orn. Club, I, March, 1899, p. 27); November, 1904, to March 4, 1905, one individual all winter (Emerson, Condor, VIII, March, 1906, p. 51). Watsonville, Santa Cruz County: specimen taken September 17, 1903 (Hunter, Condor, VI, Jan., 1904, p. 25). Paicines, San Benito County, "sparingly winter resident" (Mailliard, Condor, III, Sept., 1901, p. 126). Salinas Valley, "near Monterey," in small numbers (Cooper, Orn. Calif., 1870, p. 21). Paso Robles, San Luis Obispo County, "quite a number" in winter; one pair known to have nested; thought to be increasing (Thompson, Condor, II, July, 1900, p. 89). San Simeon, San Luis Obispo County, one seen July 20, 1905 (Jenkins, Condor, VIII, Sept., 1906, p. 129). Wasioja, Santa Barbara County, seen in December, 1909 (Rowley, MS).

The last three records are the southernmost in the central coast region of California, that is, in the region north of Santa Barbara. Paso Robles is the only breeding station known to me in all that area. This point being in the southern Salinas Valley and separated from the coast belt proper by a mountain range, probably possesses climatic features most nearly like those due east in the parallel valley of the San Joaquin. It will have been noted that all the rest of the records are for fall and winter birds. This would appear to indicate a slight migration west-and-east from the San Joaquin Valley, possibly involving birds-of-the-year only. Originally the Mockingbird of California was probably distinctly migratory; those lines of descendants finding themselves in the areas of most equable climate have come to a standstill. This would appear to me to be more probable than that the traces of migration observable at the present time are the beginnings of a general migratory habit which may become established in the future. It is notable that as a rule records farthest away from the normal breeding range, even the northernmost, are of fall and winter occurrences.

From Santa Barbara southeastward throughout the San Diegan faunal district the Mockingbird is well known as an abundant breeding species and permanent resident. It is in this San Diegan district, more particularly about suburban gardens and citrus orchards, that the species appears to thrive better than elsewhere in California. Moreover, the bird is becoming more and more abundant as the region is brought into a higher state of cultivation. In Los Angeles County during the past twenty years I have witnessed the continued increase both in its numbers and the area inhabited by it.

Originally a bird of the wide, open "wash," or arroyo, sparsely dotted with small live oaks, clumps of elder and sumach, and patches of prickly-pear cactus, the Mockingbird has now come to be the most conspicuous avian tenant of the highly cultivated orchard and garden. The original habitat of the bird, to which it was restricted, is of scarcely less extent now than formerly; and Mockingbirds are still to be found there in numbers which appear to me not materially greater or less than twenty years ago. But an area of several times this extent, which was formerly either bare grass-land or else thickly covered with chaparral, and in either case at that time unoccupied by the Mockingbird, has now been altered by cultivation until it evidently affords an attractive and permanent abode. Many an area in the vicinity of Pasadena, where fifteen years ago such birds as Horned Larks, Meadowlarks, Lark Sparrows and Burrowing Owls abounded, now know these species no more; but the Mockingbird is in evidence in every block. As a specific instance, all that area of North Pasadena between Monk Hill and Devil's Gate was once pasture land or at best a grain field, where I never saw a Mockingbird. A recent drive through the same section, now a populous suburb, disclosed the presence of the Mockingbird in numbers.

The Mockingbird is accordingly one of the relatively few species of birds which have not only withstood the effects of cultivation, but which have notably increased as a result of it. In looking over a map of the Pacific slope of Los Angeles County, knowing as I do the local conditions both now and formerly in much of that area, I believe I am conservative in estimating that the Mockingbird now occupies five times the area that it originally did. In other words there are now fully five times as many Mockingbirds in the region as formerly. I believe similar conditions to hold true with regard to many other parts of the San Diegan faunal district.

The so-called citrus belt seems to be the metropolis of the Mockingbird. The citrus belt lies in a portion of the Lower Sonoran zone possessing a semi-arid climate, and in which, although the summers are hot, the annual range of temperature downward is not so great as to bring killing frosts. A law was long ago formulated by C. H. Merriam (Nat. Geog. Mag., VI, 1894, p. 236) to the effect that the northward distribution of animals and plants is determined by the sum of the positive temperatures for the entire season of growth and reproduction, and that the southward distribution is governed by the mean temperature of a brief period during the hottest part of the year. The range of the Mockingbird appears to be accounted for under the first portion of this law, though not altogether. The bird is of Austral origin, and in California is but slightly or not at all migratory. The upward extension of its breeding range is clearly limited by the temperature conditions obtaining for a large portion of the year, including the summer, at the upper edge of the Lower Sonoran zone. Its winter range is the same except (1) that there is a scattering movement of birds-of-the-year in the autumn, leading to their appearance during the early winter in the warmer central coast belt of California; and (2) that there is a vertical movement in the Mojave Desert and Death Valley regions as an escape from the cold of the interior concomitant with altitude. It is doubtless the severity of the winter climate, in other words the normal dropping of the temperature below the freezing point, that accounts for the relative scarcity of Mockingbirds on the higher deserts of southeastern California, where Lower Sonoran conditions find their extreme in summer.

That food is not a prime factor in the case, as it clearly is in controlling the winter distribution of certain other birds, is shown by the fact that the Mockingbird is pre-eminently a berry-eater, especially throughout the fall and winter. On parts of the Mojave Desert mistletoe thrives and produces enormous crops of its berries which in other localities, namely those of warmer winters, form a favorite food of the Mockingbird. But this abundant food is still not a sufficient attraction to overbalance the repelling effect of the cold. Yet the latter is not sufficient to affect adversely other berry-eating birds such as Western Bluebirds, Cedarbirds, and Solitaires, all these being species which summer in the Transition or Canadian zones.

The Mockingbird is clearly very sensitive to temperature. It must have warm summers, and warm winters as well. It is thus similar in its demands to the orange tree. The popular notion that it is by preference a bird of the orange grove, is based upon a coincidence in the ecologic requirements of the bird and the plant, and upon something more. While it does not appear that the Mockingbird depends at all on the citrus tree for food, yet it is a significant thing that the dense, stiff-twigged foliage of the orange is most nearly like that of the small live-oak of the wash. And both these trees are preferred above all others as sites for the nests of the bird.

While the Mockingbird of California is not a regularly migratory species in any true sense, it is of interest to recognize the local and partial seasonal movement in west central California. There is an exodus in small numbers from the San Joaquin Valley into the coast belt for the winter, when the former area is colder than the latter; and the movement reverses in the spring when the former is hotter than the latter. There is thus a longitudinal shifting back and forth, though this involves only a fraction of the population of the interior valley; this residual seasonal movement is apparently due to shifting temperature conditions, again reflecting the sharply defined temperature requirements of the bird.

SUMMARY.— The Mockingbird is essentially a non-migratory species. It is restricted to a relatively small range in California because of its evident extreme sensitiveness to temperature. It adheres not merely to a zone of high summer temperature as do many other non-migratory birds, but to a small portion of that zone which also possesses a high winter temperature, above that of severe frost. This combination of suitable summer and winter conditions is found in the Lower Sonoran zone, in the San Diegan district of southern California (northwest to Santa Barbara), and in the bed of the San Joaquin Valley. Even in these restricted belts the Mockingbird exhibits still further preferences dependent upon plant association. It happens that the cultivated citrus orchard satisfies the bird's predilections as regards the native associations. Also the citrus orchard coincides in its own seasonal temperature requirements with those of the Mnckingbird. Hence we find the Mockingbird a characteristic inhabitant of the citrus belt; and, as the areas devoted to citrus culture increase, the Mimine population augments. It is estimated that Mockingbirds have increased five-fold, both in numbers and localities inhabited, since the settlement of the country. The Mockingbird is thus one of the few species which are responding favorably to intensive cultivation as the valleys of southern and central California become closely settled.

DESCRIPTION OF A SPECIES OF *PROCELLARIA* WHICH IS FOUND AT THE NORTH POLE.[1]

BY ANTON ROLANDSON MARTIN, *Med. Stud.*

Translated by *S. M. Gronberger.*

THE shape of this bird is best seen from the figure, Tabula III. I take the liberty of making the description in Latin.

CAPUT subrotundum.

- *Oculi* orbiculati, atri.
- *Rostrum* longitudine capitis, laeve, subcompressum, gibbum.
- *Mandibula* superior constans ossiculis quinque sutura connexis: *Lateralia* duo lanceolata, margine laterali acuto extra mandibulam inferiorem; *Nasus* tubulosus subtruncatus, elevatus supra rostrum eoque dimidio brevior, subcarinatus, e duobus ossiculis. *Nares* cordatae. *Apex* rostri qvintum ossiculum constituens, a naribus spatio remotus, maxilla inferiore longior, gibbus, inflexus, aduncus, cultratus, acuminatus.

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[1] Beskrifning på en Procellaria, som finnes vid Norrpolen, in Kungl. Vetenskaps-Academiens Handlingar, för år 1759, Vol. XX, pp. 94–99, Stockholm, 1759.

This appears to be the earliest description of *Procellaria glacialis* Linn. extant, and although the author does not name the bird, there can be but little doubt as to its identity with the *Fulmarus glacialis glacialis*. This description also agrees with that of Linnæus in 'Fauna Suecica,' Ed. 2, Stockholm, 1761, p. 51, where it is said: *ungue postico absque digito. Nares constant unico cylindro. . . . . mandibulis cx 5 ossiculis.*" (Translator.)

Mandibula inferior etiam e quinque ossiculis sutura connexis composita, quorum 2 marginalia linearia angusta, 2 inferiora lateralibus parallela, lanceolata, canaliculata, apice deorsum vergentia, quintum *apicem* constituens latius, cordatum, adscendens, complicatum, brevius quam latum, obtusiusculum.

COLLUM capite paulo longius.

TRUNCUS ovatus, epressiusculus, magnitudine Cornicis, plumis densissimis, praecipue subtus, tectus; pectore prominulo.

ALAE lanceolatae, cauda longiores, *Remigibus primoribus* 9 obtusiusculis, sensim versus exteriora longioribus; *secundariis* plurimis, breviusculis, laxioribus, obtusioribus.

CAUDA rotundata, pedibus fere brevior, Rectricibus circiter 16, obtusis.

PEDES. *Femora* supra genua nuda. *Tibiae* compressae. Plantae tridactylae, palmatae. *Ungves* acuminati, subarcuati, intermedius latere interiore marginatus; *Digitus* posticus nullus, sed ungvis conicus sessilis juxta plantam.

COLOR. *Dorsum* canum. *Remiges primores* a latere nudo fuscescentes. *Cauda* subcanescens. *Caput, Pectus* regio *Ani* albida. *Abdomen* cinereo-albicans. *Rostrum* fusco-incarnatum. *Oculi* nigri. *Pedes* incarnati.

REMARK.

This bird has so much in common with *Procellaria æquinoctialis* that I am not sure whether it is a different species, or whether *it*[1] also differs with reference to age; because it is generally known that Lari [Gulls], with which this genus is most closely related, are, when young, mostly of a brown color, which in the second year is changed into white or gray. The single fact that seems of significance to me and which might be the surest indication of a difference, is that Mr. EDWARD [Edwards], who has so accurately depicted his birds, has in the other [the *P. æquinoctialis*], reproduced the nares as if composed of two distinct cylinders [tubes], which is not the case in this bird.

SYNONYMA. He has not been correctly described by any author; but 'occurs in several travellers' descriptions under the name of *Mallemuke.* Bishop Pontoppidan, in his 'Norges Naturlige Histori' [Natural History of Norway], mentions it only in Part II, page 144, and states he has heard nothing else of the bird than that Burgomaster Anderson referred to it in his accounts of Greenland and Davis Strait [Anderson Island, 173, n. 30].

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[1] Italics by Transl

Mr. Anderson designates this bird as *Larus marinus maximus, ex albo, nigro & fusco varius, groenlandicus.*[1] See the same accounts, pag. 173.

It might not be out of place to quote briefly what the Burgomaster, on pag. 168, has to relate about the behavior of a live specimen which he had secured. The following is an extract of the account: "In the year 1753 I obtained a live Mallemuke; he knew how to act in both good and bad weather and always seemed to relish his food exceedingly well. He was very greedy of raw meat, and devoured entire fishes and large pieces of flesh; the food was quickly digested and he soon voided his excrements, whereupon his appetite immediately returned. He fought bravely with both cats and rats, etc., dealt out savage jabs with his big beak, and whenever he had secured a cat by the tail he treated it so roughly that it cried out for mercy; for this reason all such animals sought safety in flight when they caught sight of him. In the presence of man he was only shy, although not unreasonably so, but toward those who provided him with food he was tame and docile. I afterward brought the bird to an artist for the purpose of having a drawing made of it, and on this occasion he seemed to be in low spirits and did not desire to eat, but upon our return home he ran up to my coachman, who had often been kind to him, and acted as if glad of having returned to his old acquaintances. As often as he was teased with a piece of white cloth, the bird cried out sharp and loud."

FURTHER EXPERIENCE OF ITS PROPERTIES.

We first noticed these birds between 62 and 63 degrees north latitude, and they accompanied us by flying around the ship until we reached Spitzbergen, and even when we were as high as 79–80 degrees [north lat.]. Where no other living thing was to be seen, these birds were flying between the ice-floes. The bird is one of those which have been provided by the Almighty Creator to cleanse the sea from the dead and stinking carcasses of whales.

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[1] The *Procellaria glacialis* of Linnæus is based on this bird. (Vide supra.) See also Brünnich, Orn. Bor., No. 118, p. 29. His note, however, evidently refers to the *Procellaria capensis* = *P. æquinoctialis* (?), which seems to have been known prior to the *P. glacialis* Linn. (Translator.)

As soon as a whale fish [*sic*] is caught they arrive by the thousands (together with some other birds which I had not the good fortune of securing), alight on the carcass and, paying no heed either to cuts or blows, seize one piece after another and devour them with such a greed as almost to suffocate themselves. They have therefore also a belly-mouth (oesophagus) which, hanging like a bag, extends to the anum,[1] besides which they have only a few small intestines. Their stupid audacity renders them obnoxious and troublesome to the whalers, and for this reason they call the bird Mallemuke, which means a wicked or malicious Gull; therefore several boatswains are also stationed with their launches on either side of the whale, and these are also called Mallemuken, from the fact that it is their duty, beside handing knives and grindstones to the harpooners, to chase away the birds with their boathooks. In doing this they beat some of them to death in order to obtain for the ship's crew a refreshing soup called by them *Puspaes,* which is made from the breast of this bird, boiled with rice. The breast is quite fleshy in consequence of the extended flights which they are obliged to make on the stormy sea [*i. e.*, from the great development of the pectoral muscles]. I seldom saw them in the water when the weather was stormy, but only when there was calm and quiet. They do not dive much, but fly high up in the air, and then again close to the surface of the water, should there happen to be anything washed up by the waves, or from the movement of the water caused by the ship.

They seldom come ashore except to lay their eggs, which is done on the uttermost islets of Spitzbergen, where an island has been named for them Mallemoeken-eyland.

Beneath the stomach, and inside the coarser feathers of this bird I found a cavity which was surrounded by small and fine down: it cannot be seen from without; but it is quite plain on the bird which I have mounted and from which the figure has been made.[2] Perhaps its eggs are hatched out beneath this cavity, and this presumably takes place in the naked rock-crevices; on June 7, at which time they are said to lay their eggs, I found this [cavity] in the bird.

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[1] Lat. acc., as in original. (Translator.)

[2] In Fabricius, O., Fauna Groenlandica, Hafniae, 1780, p. 86, the following reference to this "cavity" is made: "*Aream deplumen sub abdomine etiam reperi.*"

They are well provided against the cold, as are all birds and animals [*sic*] that are found here. Close to the body they have a pretty fine down, like silk: outside of this there are quite thick feathers. Their skin is interiorly lined with fat, and I must not omit to state the fact that all of their intestines, vasa, blood vessels and nerves were quite as distinct as in the larger animals. It was therefore a matter of small wonder to me that they were so hard to kill whenever an attempt was made in that direction.

LIST OF BIRDS OBSERVED IN ESTES PARK, COLORADO, FROM JUNE 10 TO JULY 18, 1910.

BY OTTO WIDMANN.

THE name Estes Park, called after its first settler, Joel Estes, October, 1859, is given to a beautiful region in Larimer County, north central Colorado, Lat. 40° 24′ north, Long. 105° 30′ west. The park is twenty miles long from east to west and fifteen miles wide from north to south. Estes village is its center at the junction of Fall River with Big Thompson River. Two creeks, the Black Cañon from the northwest and Fish Creek from the south, also empty their waters into the Big Thompson at this place. Except in the vicinity of the village, which has now a hundred cottages where there were ten a few years ago, the valleys of the different streams are mostly too narrow for cultivation. Large short-grass meadows with sparse tree growth form the original 'parks' along the sides of the river bottoms, but in many places the walls of the mountains are so steep and so near the water, that even the road had to be cut through the rocks. This is particularly the case in the Big Thompson Cañon between the village and Fork's Hotel at the mouth of the North Fork, a distance of about ten miles full of wild scenery, but now more and more occupied by cottages and camps wherever there is a spot level enough to pitch a tent. The elevation of Fork's Hotel is 6160 feet and that of the village of Estes at the post-office is 7500 feet. Elkhorn Lodge, at the west end of the village, one half mile from the post-office, is 7550 feet; Horse Shoe Ranch, five miles up in the Fall River valley, is 8500 feet; Miller's Ranch and Rustic Hotel, five miles north of the post-office, are 7,900 feet; Stead's Hotel, five miles southwest, is 8000 feet, and Long's Peak Inn, eight miles south, 9000 feet above the sea.

All these places are connected by fine driving roads, and it is mainly along these roads and within one mile of them that the notes were taken. No attempt was made to reach timberline, and the highest region visited was about 9500 feet in the vicinity of Long's Peak Inn, which region, for the sake of shortness, will be called Mills Park, named after Enos Mills, the genial proprietor of the Inn. Lying in the lap of the Front Range with its long row of high peaks, one of which, Long's Peak, reaches a height of 14,259 feet, and enclosed by chains of so-called foothills, most of them over 8000 feet high, the views from the roads of Estes Park are an ever changing panorama of mountain scenery, made most picturesque by the numerous snow fields which crown the loftiest peaks. Even as late as June 24 a fresh layer of the 'beautiful' added to the magnificence of the Front Range as beheld from the village, and when we left the valley four weeks later, large patches were still defying the hot rays of a burning July sun.

What enormous quantities of snow are deposited during the long winters in those heights can be conceived only when we consider that all the water carried down to the plains throughout summer is the product of melting snow, the precipitation during summer being hardly sufficient to keep the ground moist enough for the growing vegetation.

From June 10 to July 5 the base of our operations was at Elkhorn Lodge; from July 6 to 15 at Long's Peak Inn, and from July 15 to 18 at Fork's Hotel. Long's Peak Inn lies in the middle of a valley covered partly by a level meadow, called Glacier Meadow, one mile long by one fourth of a mile wide and very swampy in places, especially so near the inn, where the Inn Brook meanders through it. Up to 9000 feet the yellow pine (*Pinus scopulorum*) makes fine trees, as a grove of them near Long's Peak Inn demonstrates. From 8000 feet up the lodgepole pine (*Pinus murrayana*) makes its appearance and begins to make pure, almost impenetrable, stands. The Douglas spruce (*Pseudotsuga mucronata*), which in the lower valleys is chiefly found with the blue spruce (*Picea parryana*) in the creek bottoms, becomes more common at 8000 feet and extends with the lodgepole to 10,000 feet. Engelmann's spruce (*Picea engelmanni*) and balsam fir (*Abies lasiocarpa*) occur along streams from 8000 feet up, but their real home is above 10,000 feet to timberline. White or limber pine (*Apinus flexilis*) is found locally from 8000 feet up, but is more abundant in the Engelmann spruce and balsam fir zone. Wherever we go, we soon meet with large tracts of very scant tree growth covered with the prostrate remains of trees destroyed by forest fires. It is highly probable that most of these fires were caused by lightning, as the almost daily occurring storms are often accompanied by severe discharges of electricity, which in drouths may easily set trees on fire. Not far from the Elkhorn Lodge we saw a pine of three feet diameter split in two in the middle for a distance of twenty feet to the ground. Deciduous trees are greatly in the minority and of small size except the aspen, which makes sometimes pure stands and grows to over a foot in diameter. Willows and aspens with some alder, birch and wild cherry make the bulk of the thickets along the streams from 7500 feet up, while at lower elevations the narrow-leafed cottonwood is added, but there are no oaks, elms, sycamores or any others of the many kinds of trees which fringe the water courses in the Eastern States. Mountain maples (*Acer glabrum*) make thick bushes at Fork's, where the hillsides, apparently too dry for conifers, are covered with shrubs and low vegetation. Although at first not inviting looking, these stony hillsides were found to harbor many more birds than one would expect, being attracted by the many eatable berries and seeds of the plants growing there and ripening in July.

June is the month when the wonderfully rich flora of these mountains is in its greatest glory. The earliest flowers of the year are then still in evidence, among them the modest pasque flower (*Pulsatilla hirsutissima*) and the conspicuous flowering raspberry

(*Oreobatus deliciosus*). The ground of the short-grass hills is at this time literally covered with flowers of many colors and shapes. To one not acquainted with the flora of the region the strange forms of *Oreocarya virgata*, *Frasera stenosepala*, *Elephantella grœnlandica*, *Eriogonum umbellatum*, and *Castilleja linariæfolia* are some among the striking novelties of the park. He will also wonder at the beauty of the snowy-white flowers of the evening primroses (*Anogra* and especially *Pachylophus cæspitosus*) growing abundantly in company with the golden-yellow bunches of the stone-crop (*Sedum stenopetalum*) on the bare gravel, where nothing else can find a foothold. He will admire the rich coloration and abundance of the loco-weeds (*Aragallus*) and their cousins *Lupinus* and *Thermopsis*, all conspicuous for bright colors. Toward the end of the month the great-flowered Gaillardia adorns the hills, the Mariposa lily opens its unpretentious flowers, and the blue columbine shines through the woods. Along the creeks innumerable shooting-stars decorate the banks, and wherever we go, we see representatives of such well-known genera as *Achillea, Arnica, Aconitum, Campanula, Cleome, Crepis, Delphinium, Epilobium, Erigeron, Erysimum, Lappula, Lithospermum, Penstemon, Phacelia, Polygonum, Senecio, Solidago*, etc.

The climate of the region would have been nearly perfect during our stay, had it not been for the almost daily occurrence of thunderstorms with or without precipitation, often only a sprinkle, but sometimes heavy rain with much hail and followed by a strong, cold wind from the west. The early morning hours were ideal; the clearest sky imaginable with cool, though never freezing, temperature, soon tempered by the unobstructed rays of the sun. With the rise in temperature the sky began to change its appearance. As early as eleven, sometimes before ten o'clock, the first clouds gathered around the high peaks, and by noon they had formed dark, often black, masses, from which went out streaks of lightning accompanied by very unpleasant rumblings of thunder. These threatening clouds may linger for hours among the peaks with very little movement, or they may break out with great rapidity and pour out their wrath for half an hour or more. With few exceptions every afternoon was thus partly lost for fieldwork by the unpleasant weather conditions, but when the storm did not only threaten but really bring a good rain, everything was refreshed, plant and bird, and the laziest songsters became musical for a short time.

Compared with eastern birds the songsters of the region were with few exceptions the laziest musicians imaginable; not even the early morning hours, which are so full of melody with us, induced them to much effort, and during the day the silence away from the village was almost exasperating even in June, still more so in July. The farther away from human activity the more retiring were their habits, and with the thick vegetation along the watercourses and the dense foliage of the evergreens it was easy enough for any bird to hide and remain invisible even when singing or calling. Not only their song but even their call-notes were much softer than those of their eastern relatives, and it took the sharp ear of Mrs. Widmann to notice the faint lispings of the Empidonaces and other slender-voiced species.

From the long list of summer residents it might be inferred that there is an abundance of bird life to be found in Estes Park, but such is not the case. By visiting the surrounding mountains at an elevation of over 10,000 feet the list could have been swelled to a full hundred, but of this great number of species only about a dozen could be called common, and these only near human habitations.

The Western Robin was by far the most numerous and conspicuous bird at all places visited, and its song, frequently the only one heard, was freely given at all hours of the day and until dark in the evening. Next to the Robin in abundance and singing was the Western House Wren, whose musical ability was found to be of a higher quality than that of its eastern cousin; it had a finch-like intonation, which was rather misleading at times. Conspicuous by its lovely color and charming fearlessness was the Mountain Bluebird. Unfortunately it was a silent bird; only a short, ventriloquial call-note, slightly reminding the dear carol of our eastern Sialia, was heard when the parents tried to keep the family together. Along the watercourses in the neighborhood of settlements the Warbling Vireo and the Mountain Song Sparrow could be called common, as their songs could not escape the ear of anyone who cares for bird music; away from men they were rather rare, and the same can be said of the White-crowned Sparrow.

Locally common were the Brewer's and Red-winged Blackbird; the former on short- and long-grass meadows and in the village itself; the latter only on wet meadows. Both species occurred in flocks at Fork's at the middle of July. Of Swallows the Violet-green was the most common and generally distributed, but in the centre of the village the Eave was the most numerous, with nests on cliffs as well as under eaves.

Of Woodpeckers, the Red-shafted Flicker was the only one which could be called common; but the two Sapsuckers, the Red-naped and Williamson's, although not numerous, appeared so at times through their habit of flying long distances to fetch food for their young, thereby crossing and recrossing continually valleys, roads and buildings. Numerous without appearing to be common because of their diminutive size and quiet ways were the Pygmy Nuthatch and the Mountain Chickadee. The Chippy, present at or near every settlement, did not play a conspicuous part, being rather shy and silent. The Pine Siskins were more in evidence, though less numerous, by their fearless manner in feeding by the wayside in small troops. Very prominent without being really numerous were the Magpies and Long-crested Jays because of their large size, loud voice, and gregarious habit, at least at the time of our visit, when they moved in family groups with constant chattering.

Lists of the birds of Estes Park have already been published. Vernon Lyman Kellogg's 'Notes on some Summer Birds of Estes Park, Colo.' was published in 1890 in the Transactions of the Kansas Academy of Science, Vol. XII. His observations were made during the summers of 1886-89. He noted 60 species and added 16 species on the authority of Gilbert Pierce, formerly of Lamb's Ranch, Estes Park. Richard C. McGregor's 'Birds of Estes Park,' observed in July and August, 1893, was published in 'The Nidologist,' Vol. IV, pp. 3-5, January, 1897. He mentions 58 species. Comparing these lists with the present one we find that some change in the bird fauna has been going on during the seventeen years since McGregor made his observations. The principal difference seems to be in the addition of eastern species, which have advanced through the foothills deeper into the mountains with the settlement of the valleys.

Not counting those species that have been found only at Fork's, 6160 feet, which place was probably not visited by Kellogg and McGregor, twelve species must be considered new additions from the east to the bird fauna of Estes village. They are Chestnut-backed Bluebird, Catbird, Western Yellowthroat, Yellow Warbler, Rough-winged Swallow, Western Vesper Sparrow, Pine Siskin, House Finch, Cowbird, Bobolink, Kingbird, House Sparrow.

Increased in numbers seem to have the following: Western Robin, Western House Wren, Mountain Song Sparrow, Barn Swallow, Red-headed Woodpecker, Red-winged Blackbird, Western Meadowlark, Pygmy Nuthatch (of which Kellogg saw but one), and the Band-tailed Pigeon, now protected by State law until September 1, 1914.

Decreased have: Kingfisher, Rock Wren; Western Tanager, which McGregor found abundant; Cassin's Purple Finch, also called abundant by McGregor; probably also Audubon's Hermit Thrush, found "not uncommon" by Kellogg. That Cassin's Kingbird has ever been common, as Professor Kellogg found it twenty years ago, is so much more astonishing as not a single individual has been met with anywhere. To the decrease of Birds of Prey is due the enormous increase of Chipmunks and Spermophiles, and to their increase the scarcity of birds which build on or near ground. The little chipmunk (*Eutamias amœnus operarius*) may be less injurious to birds than the larger one, Say's spermophile (*Callospermophilus lateralis*), which is by far the commoner of the two at the altitude of Long's Peak Inn, 9000 feet. That not even bird nests in low trees are safe from the attacks of this rodent, which has the size of a house rat, was proved to us June 28, when near Horse Shoe Falls our attention was called by the most piteous cries of a pair of Audubon's Warblers to a young Douglas spruce, in which a Say's spermophile was climbing up and had already reached a height of three feet, climbing higher in spite of the hostile demonstrations of the distressed warblers. Eight feet from the ground and two feet from the tip of the spruce was the home of four not yet fully fledged warblers and it was clear that the 'rat' intended an attack upon it, for the animal is never seen to go up trees in its ordinary occupation, which is chiefly aimed at the destruction of wild flowers, on which it seems to live in summer, thereby reducing considerably the beautiful flora of its habitat. Natives attribute the present scarcity of birds to the savage pastime of some campers, who spend the dull hours of the day hunting. As there is no game to be killed, and as it would be against the law to kill none-game birds in Colorado, the hunters pretend to shoot only Magpies and Jaybirds, which are exempt from protection. Mr. Mills told us that there were times when parties of campers wagered, which party would bring home the largest number of birds after a day's hunting. It is not nearly so bad now, but the whole region around Estes Park should be made a National Park, in which no shooting at all should be allowed. The influx of visitors becomes ampler every year since the roads to Lyons and to Loveland have been made so pleasant for automobiling, and on Saturdays as many as fifty automobile parties come from neighboring towns, mainly from Denver, to spend the Sunday in the park. While Say's spermophile, the mountain rat (*Neotoma*), the weasel (*Putorius*) and the bobcat (*Lynx uinta*) are destructive to birds nesting on or near the ground, the boy with the gun must be regarded the most dangerous enemy of birds in general, but with the prohibition of firearms and the reduction of the superabundance of chipmunks and spermophiles it may be hoped that Estes Park becomes as much a paradise for birds in Colorado as Yosemite Valley is in California.

List of Species.

1. **Porzana carolina.** July 9. One in very fine plumage in swampy part of the Glacier Meadow within one hundred yards of Long's Peak Inn. Became very much excited on approach and walked about with many sharp '*kigs*,' as if fearing for its nest or young. It was again seen at the same place on the following day.

2. **Gallinago delicata.** First seen on fence post near Long's Peak Inn July 7, 8.45 A. M., uttering loud calls. Again seen on evening of July 8 on fence post uttering the same loud calls, which we heard in two other places in the Glacier Meadow between Long's Peak Inn and Lamb's Ranch on several evenings between July 9 and 14 and which were continued until 8.30 P. M., when it was almost dark.

One was seen walking in the water-covered part of the meadow on the morning of the 9th with incessant calls of *wack*, apparently calling its young ones.

3. **Actitis macularia.** Two adults with three very small young ones

were seen June 25 at Lily Lake, 8900 feet. One was seen at Sheep's Lake 8500 feet July 1, and one at Mills brooklet, July 8, 9000 feet.

4. **Colinus virginianus.** One female ran across the road near the Electric Light Plant in Fall River valley July 1, and two on the same day near Horse Shoe Ranch, 8500 feet. Two in Lamb's Ranch, July 14, 9040 feet.

5. **Columba fasciata fasciata.** One flock of 25 on Miller's Ranch, 7900 feet, in oatfield, June 21. Another flock of 20 visiting the oatfield of the Horse Shoe Ranch, 8500 feet, June 22, July 1 and 2.

6. **Zenaidura macroura carolinensis.** Numerous at Fork's, 6160 feet, July 15–18. A few in Estes village frequenting the lawns. None higher up than Moraine Park, 8000 feet.

7. **Accipiter cooperi.** One flew low over Elkhorn Lodge at sundown July 2, going straight up Fall River valley.

8. **Buteo borealis calurus.** Two young and one adult, seen together in the air above Beaver Creek valley, south of Deer Mountain, June 22. One adult, in air above Wind River valley, June 25. One above Mills Beaver Lakes, 2 miles south of Inn in Mills Park, July 7. One over Inn, July 10. One over Schwarz's beaver pond, 4 miles south of Long's Peak Inn, July 12.

9. **Buteo swainsoni.** One over Old Man Mountain, June 12.

10. **Archibuteo ferrugineus.** Two in fine dress low over Fall River valley, June 10.

11. **Falco mexicanus.** One chased a Sparrow Hawk across Glacier Meadow July 9; again seen at same place July 11. One flies down Big Thompson valley toward Prospect Mountain July 15.

12. **Falco sparverius phalæna.** Six pairs were located. One in Fall River valley; one in Black Cañon near Twin Owls Mountain; one in Beaver Creek valley; one at Mary's Lake; one feeding young in hole 6 feet from ground in Mills Park, July 10, and one with one young just out of nest near Fork's, July 16.

13. **Otus asio maxwelliæ.** July 8 to 14 repeatedly heard after dark in vicinity of Long's Peak Inn. Two and three heard at same time.

14. **Bubo virginianus pallescens.** One June 19, on side of Old Man Mountain, where, according to natives, the species has been nesting for years.

15. **Ceryle alcyon.** One in Fall River valley, June 14. One in valley of North Fork of Big Thompson River, July 16 and 17.

16. **Dryobates villosus monticola.** Only one pair, near Horse Shoe Ranch, July 2.

17. **Dryobates pubescens homorus.** One pair repeatedly seen (June 18, 24, 29) near Stanley's hotel, 7550 feet.

18. **Sphyrapicus varius nuchalis.** Ten pairs located: One at Fork's; three near Estes village; two at Horse Shoe Ranch; one in Lamb's Ranch (9040 feet) feeding young in nest July 14; one at the Long's Peak Inn; one at Mills Beaver Lakes; one at Columbine July 8. The young of this and the next species are so noisy that nests are easily found.

19. **Sphyrapicus thyroideus.** Four pairs feeding young in holes 8 to 20 feet from the ground in pines. One near Elkhorn Lodge, June 11 to 19. One near Stanley's hotel, June 11 to 30. One in Mills Pine grove, still feeding July 9. One, Lamb's Ranch, young leaving nest July 12.

20. **Melanerpes erythrocephalus.** Three pairs; two on hill south of Elkhorn Lodge; one near McGregor's Ranch, north of the village, 7600 feet.

21. **Asyndesmus lewisi.** Only at Fork's, 6160 feet, where were four pairs within two miles; young just out of nest July 16.

22. **Colaptes cafer collaris.** Eighteen pairs located between Fork's and Long's Peak Inn. Fully grown young July 15 at Fork's.

23. **Phalænoptilus nuttalli nuttalli.** Only in one place; two birds heard at 8 P. M., June 19, on plateau above forester Ryan's lodge south of Old Man Mountain.

24. **Chordeiles virginianus henryi.** Singly or in troops nearly every evening at all places. One young, hatched the same morning, was shown us July 14 by Mr. Dean Babcock, who had watched the sitting bird during the entire incubation of 21 days. One of the two eggs was deserted by the parent who removed the newly hatched young about six feet from the nest.

25. **Cypseloides niger borealis.** Two were hunting over Glacier Meadow, 9000 feet, in the evening of July 8, and on July 10 three were seen at the same place at 11.30 A. M., during a light rain which preceded a heavy hail storm.

26. **Aëronautes melanoleucus.** Only three times seen for a few moments, singly or twos, over the village June 17, 21, July 3, always between 8.40 and 10 A. M.

27. **Selasphorus platycercus.** Seen from June 16 to July 16 at twelve places at 6150, 7500 and 9000 feet. Two stations, on tip of dead trees, of males watching nesting ground in Mills Park (July 5 to 15). Saw male playing, up and down flight, July 10; male chasing Brewer's Blackbird, July 7.

28. **Tyrannus tyrannus.** June 19, one in Estes village, 7500 feet, near mouth of Fall River. July 15–18, six pairs in valley of North Fork, 6160 feet, where quite conspicuous; one feeding young in nest in pine fifty feet from ground.

29. **Nuttallornis borealis.** One at Mills Beaver Lakes, 8700 feet, Mills Park, July 7.

30. **Myiochanes richardsoni.** Five pairs in Estes village, where they were often heard until 8 P. M. Also at Gem Lake, 8000 feet, Horse Shoe Falls, 8500 feet, but none at Mills Park. Several at Fork's, where a partly albino would have been difficult to recognize if he had not been calling continually. The bird was pure white on the breast and tail and had black stripes on the white head, resembling the markings of the White-crowned Sparrow.

31. **Empidonax difficilis difficilis.** Repeatedly heard and seen at four stands in Estes village and one mile west on Fall River.

32. **Empidonax hammondi.** In three places along North Fork within one mile of Fork's.

33. **Empidonax wrighti.** July 9, one in a pasture near Long's Peak Inn; at same place, July 10. July 12, one in Lamb's Ranch.

34. **Pica pica hudsonia.** At all places. Young out of nest June 18, fully grown except tail. Usually seen in families. Old nests in many places, some as low as eight feet. Much shyer than Jays and do not come into the village or near buildings.

35. **Cyanocitta stelleri diademata.** At all places; at first only single birds seen. After June 22, mostly in families. At Fork's, a troop of twelve on the ground near camps.

36. **Perisoreus canadensis capitalis.** July 1, one flying across Horse Shoe Park, near Sheep Lake; July 13, a family in Lamb's Ranch, where they are said to breed and winter. They seemed to be quite at home and came within a few yards of the buildings, scrutinizing and greeting the intruders with interesting talking.

37. **Nucifraga columbiana.** Only once seen, three birds, July 13, at foot of Estes Cone north of Lamb's Ranch, about 9500 feet, coming over Wind River cañon from Lily Mountain.

38. **Dolichonyx oryzivorus.** June 15. One male in meadow near Elkhorn Lodge; under observation half an hour, but not seen again.

39. **Molothrus ater ater.** July 3. One male in pasture with cattle near Burch's chalet in Estes village.

40. **Agelaius phœniceus fortis.** About six pairs in Stanley's meadow at the east end of Estes village; about the same number in Horse Shoe Park and in Mills Park, where young out of nest were fed July 7. A flock of about thirty young ones at Fork's, July 15 to 18, and a few, still feeding young in nest, very noisy around the hotel and along North Fork.

41. **Sturnella neglecta.** A few on large meadows in every valley; several in Stanley's pasture at east end of village; in Big Thompson Valley south of village; in six places between village and Devil's Gulch; in Moraine and Horse Shoe Parks; Beaver Creek valley; Marie's Lake, and once heard song in Lamb's pasture, 9040 feet, July 12.

42. **Euphagus cyanocephalus.** At all settlements; prominent in village, where they frequent vacant lots and roads, doing much flying to and fro when feeding young. On June 19 they were particularly busy catching insects high in air. Are scolding and aggressive when one approaches their nest. First young out of nest in the village June 30. Still feeding young in nest at Mills Park July 13. In large flocks, young and old together, at Fork's, July 15–18.

43. **Carpodacus cassini.** Three pairs in the village and one at the Horse Shoe Ranch. Young male in brown singing, June 15 and 18. Pairs often come down to the ground to feed on seed of dandelion, and males sing on the ground.

44. **Carpodacus mexicanus frontalis.** One pair in the village at the foot of the cliff behind Hupp's Annex. Male sings on telephone wire.

45. **Loxia curvirostra minor.** June 20, male and female together in top of Douglas spruce one mile west of Elkhorn Lodge in Fall River valley. June 23, four alight on tree at head of Devil's Gulch, 8000 feet. June 25, calls of Crossbills flying over Mills Park.

46. **Astragalinus psaltria psaltria.** None before July 11, when two alighted in Mills Park. July 12, five fly over Lamb's Ranch going south toward Mills Park.

47. **Spinus pinus.** Small parties in the village seen almost daily; a few at Long's Peak Inn.

48. **Passer domesticus.** Two pairs in center of the village, where were four young ones flying together, June 30. Also two males seen at Stead's Hotel in Moraine Park, 8000 feet.

49. **Poœcetes gramineus confinis.** In two places on large short-grass meadow near head of Devil's Gulch, June 23.

50. **Zonotrichia leucophrys leucophrys.** Six singing males were located in the village along Fall and Big Thompson Rivers. The song was best heard in the evening after sunset and after rains, less regularly in the morning. At Long's Peak Inn one male was singing all day until dark and Mr. Mills said, he heard it often in the middle of the night. This pair was very tame and came within a few yards of the guests at the inn.

To one accustomed to the song of the species in the East the song of this Rocky Mountain bird is a great surprise, for it has no resemblance at all, only one note at the beginning to the monotonous ditty reminding one of the much more powerful and melodious song which we hear every May in the Mississippi Valley. The bearing, too, seems to lack the proud carriage of the more stately and apparently handsomer eastern brother, and if the books did not accept it as one and the same species, one could take them for different birds.

51. **Spizella passerina arizonæ.** The Chippy was found near every settlement, most numerous in the village, but also at the Horse Shoe Park, at the Long's Peak Inn, and at Fork's.

52. **Spizella pallida.** On the afternoon of July 10 I was surprised by seeing a Clay-colored Sparrow coming down to the water of the Inn brook between the Long's Peak Inn and Columbine to drink. Going to the same place next morning early I saw two young ones with a crescent of fine streaks over the buffy breast. At Fork's the species seemed to be fairly common among the sage-brush vegetation of the hillsides, several family groups being startled July 18.

53. **Junco phæonotus caniceps.** Only one bird was seen near the village at the foot of Old Man Mountain June 18. Several together and first young out of nest fed by parent were seen at Horse Shoe Park, 8500 feet, July 1. More numerous and a rather frequent songster at Mills Park, 9000 feet. A nest with four eggs July 14.

54. **Melospiza melodia montana.** Six singing males along the streams in Estes village. Song heard also at Horse Shoe and Moraine Parks; at Lily Lake, 8900 feet; at Mills Beaver Lake, 8700 feet; at

Schwarz's beaver lake, 8500 feet; but none on Glacier Meadow, 9000 feet, where entirely replaced by Lincoln's Sparrow.

55. **Melospiza lincolni lincolni.** Only one pair in Estes village in Stanley's pasture, together with Song Sparrows on the same ground. Also with Song Sparrow in Horse Shoe Park, 8500 feet. More common in Mills Park, where their song could be heard at all times of the day at Long's Peak Inn, the singer sitting within a few yards of the building. Four were in song at the same time in Glacier Meadow and several more along Inn Creek, which flows south toward the St. Vrain River.

56. **Pipilo maculatus montanus.** Only at Fork's, where common, in song and with fully grown young.

57. **Oreospiza chlorura.** At all places, in song, from Fork's to Mills Park, but nowhere conspicuous because shy. With fully grown young July 18 on the hillsides above Fork's.

58. **Zamelodia melanocephala.** At Fork's; in the village and Horse Shoe Ranch, but none at Mills Park.

59. **Passerina amœna.** Only at Fork's; several males in full song, and fully grown young, July 15.

60. **Piranga ludoviciana.** At Fork's and at several places in the cañon of the Big Thompson. Two pairs in the village, and one male July 12 in Lamb's Ranch.

61. **Petrochelidon lunifrons lunifrons.** Twenty-three nests were occupied under the eaves of the schoolhouse in Estes village. Several more were in use on the cliffs at the mouth of Fall River, and on the rock near the planing mill. Birds were seen near Highland Inn and in the cañon of the Big Thompson between the village and Fork's, but much larger numbers were seen in the cañon east of Fork's.

62. **Hirundo erythrogastra.** One or two pairs in the village on the Dunraven Ranch; seen also at Highland Inn and Mary's Lake. Two pairs feeding young in nests, July 15–18, at Fork's.

63. **Iridoprocne bicolor.** Associating and sitting together side by side with Violet-green Swallows were two pairs of Tree Swallows on the telephone wire in front of Long's Peak Inn, July 7.

64. **Tachycincta thalassina lepida.** The most numerous and generally distributed of the swallows; common at Fork's, as well as in the village and Mills Park. Nesting about buildings, but more frequently in woodpecker holes in the vicinity of settlements; never far from them. One looked out of an old Eave Swallow's nest under the eave of a cottage in the village; another pair building in a nook under the roof of a cottage was driven from it by a Mountain Bluebird preparing for a second brood.

65. **Stelgidopterix serripennis.** One pair at the east end of the village near Dunraven ranch.

66. **Vireosylva gilva swainsoni.** Song heard along all streams from 6000 feet to 9000 feet; but mostly near settlements; song still heard July 18, when we left.

67. **Lanivireo solitarius plumbeus.** One pair in village on bluff

above planing mill. At three places song heard and birds seen within half a mile of Fork's along Big Thompson River July 15–18.

68. **Vermivora virginiæ.** Only one male, in song, at Gem Lake, 8000 feet, July 22.

69. **Dendroica æstiva æstiva.** Three pairs in the village, where was a nest with three apparently fresh eggs, June 24, in Stanley's meadow. Song heard also in three places at Fork's, July 15–18.

70. **Dendroica auduboni auduboni.** Three pairs on the hillsides in the village; a few up Fall River valley to Horse Shoe Falls where was a nest with nearly fledged young, June 28. More numerous in Mills Park, where they visit porches and sides of cottages in search of flies. They are no hiders and therefore among the birds oftenest seen in the Park. First young out of nest in Mills Park July 9.

71. **Seiurus noveboracensis notabilis.** Only one seen at Fork's, July 16, on an island in Big Thompson River, half a mile east of Fork's hotel, started from bank with alarm note.

72. **Oporornis tolmiei.** Oftener heard than seen. Three in song along Fall River and Big Thompson River in the village; several between the village and Horse Shoe Falls; one in song near Long's Peak Inn; none at Fork's.

73. **Geothlypis trichas occidentalis.** One male in song June 30 in the village on the bank of the Big Thompson River at the foot of Prospect Mountain.

74. **Wilsonia pusilla pileolata.** Two males in Horse Shoe Park; one in Mills Park.

75. **Cinclus mexicanus unicolor.** Two nests, under bridges over the Big Thompson River, east of the village. The nests were placed directly under the floor, and the birds flew from under the bridges every time a vehicle passed over them. At Fork's they were quite fearless and could be watched under the water, both in the Big Thompson and North Fork Rivers.

76. **Dumetella carolinensis.** Three singing males in the shrubbery along Fall River and Black Cañon Creek, in the village. The song of one near Elkhorn Lodge differed as much from that of the eastern as the song of the Western Meadowlark differs from the Eastern. One at Fork's July 16.

77. **Salpinctes obsoletus obsoletus.** One had its station on the edge of the cliff behind Hupp's Annex in the village and was singing there even in the strongest breeze. Another was seen on the side of the Old Man Mountain near Ryan's lodge.

78. **Troglodytes aëdon parkmani.** One of the common birds from Fork's to Mills, not only about human habitations, but some distance from them in the woods and among boulders. Its song is more pleasing than that of its eastern half-brother, but is not given with the same liberality and perseverance.

79. **Sitta carolinensis nelsoni.** Two pairs in the village; one pair

with grown young, June 23, at head of Devil's Gulch; one pair in Mills Park, July 6; in Wind River cañon, July 7; Lamb's Ranch, July 14.

80. **Sitta pygmæa.** Seven pairs located; four in the village; one at Horse Shoe Ranch; one in Mills Park; one in Lamb's Ranch. First young leave nest June 21.

81. **Penthestes atricapillus septentrionalis.** One pair near Elkhorn Lodge; one near Gem Lake, 8000 feet; two pairs at Fork's, feeding young out of nest, July 15.

82. **Penthestes gambeli gambeli.** Five pairs near the village; two at Horse Shoe Ranch, two in Mills Park. First young leave nest June 16; building again June 26.

83. **Regulus calendula calendula.** None near the village. Lily Lake, 8900 feet, June 25; Horse Shoe Ranch, July 2; two pairs near Long's Peak Inn, 9000 feet, and one at Lamb's Ranch, 9040 feet; one at Schwarz's beaver lake, 8500 feet, July 6.

84. **Myiadestes townsendi.** One near the village, at side of Old Man Mountain, June 18 and 19; one in song, Gem Lake, 8000 feet, June 22; one in song in Wind River cañon, June 25; one on tree-top, Lamb's Ranch, 9040 feet, July 12.

85. **Hylocichla fuscescens salicicola.** Four in song in Mills Park July 8–14; heard sometimes during the day, but regularly in evening just before dark.

86. **Hylocichla ustulata swainsoni.** From Fork's to Mills, 6000–9000 feet, along all streams; one even in village near the mouth of Fall River, and others just outside of the village. One came to the lawn of Elkhorn Lodge in the early morning when everything was quiet, but otherwise they were exceedingly shy and were seldom heard to sing in day time and usually not until it was so dark in the evening that it was not easy to see them, even when one succeeded in getting near to the singer. Living always in the dense thicket, immediately adjoining the streams, the only time to observe them well is when they come to the edge of the water to feed at the bank, which they often do. When singing they sit about twenty feet from the ground in, not on top of a tree, sometimes an aspen, but more commonly a spruce or pine. The song is a very simple one, but is repeated with hardly any modulation over and over until it becomes monotonous. It may be represented by *wida widy — wida widy dewit*, with the second part often omitted. Although heard in Mills Park they were more numerous between 6000 and 8000 feet.

87. **Hylocichla guttata auduboni.** None near the village. Two, in song, at head of Wind River cañon near Lamb's, 9040 feet, and two near Long's Peak Inn, 9000 feet; very quiet, singing only a few minutes at a time.

88. **Planesticus migratorius propinquus.** The most numerous and best known of all birds, almost omnipresent in the valleys, not only near settlements, but far away from them in the woods. As common at Fork's as in Mills Park, but most abundant in the village, where their song

was heard early and late, and where parents carrying food to young were constantly crossing and recrossing the roads. First grown young out of nest June 19.

89. **Sialia mexicana bairdi.** Two pairs near village nesting in old woodpecker holes in pines; one of them was near Stanley manor, the other west of Elkhorn Lodge in Fall River valley. One of the males had the chin light, the other dark blue.

90. **Sialia currucoides.** Next to the Robin, probably the most conspicuous and best distributed bird, building not only in treeholes, but also about buildings in the village. One pair fed fully grown young June 15 and began preparing for a second brood June 19, dislodging a pair of Violet-green Swallows from a cozy nook under the gable of a cottage at the Elkhorn. In Mills Park one pair fed young in a hole only four feet from the ground, but usually the nests were in woodpecker holes higher up, some in the same tree with Pygmy Nuthatches or Violet-green Swallows, or all three in the same tree.

TWO UNUSUAL FLIGHTS OF CANADA GEESE NOTED IN MASSACHUSETTS DURING THE FALL OF 1910.

BY J. C. PHILLIPS.

IN THE following notes I wish to put on record the occurrence of two autumn flights of Canada Geese in Massachusetts during 1910, both of which seem to me of interest.

In 'The Auk' for July, 1910, I showed that the appearance of geese in any numbers was rare before October 15 to 20, at which time there are apt to be small flights. It is exceedingly hard to find Massachusetts records during the first week in October. It was therefore quite surprising to note a very considerable migration of geese on October 3 and 4, 1910. The facts which follow show that this extremely early movement was much more than an accidental occurrence.

At Wenham Lake October 3 was clear and calm, following a strong northwest wind of the previous day. There were a few Black Ducks moving in the early morning, and a bunch of six Red-breasted Mergansers was noted. At four P. M., eight geese came into the pond, followed by seven Black Ducks.

October 4 was very warm, with a strong south wind. The weather was muggy, close, and cloudy. At six A. M. sixty geese passed just east of the blind, very low and seemingly tired. Soon after, eight geese lighted just in front of us, and in an hour twelve more joined them. These geese came in and lighted without making a turn. We had no goose decoys in use, but obtained six of them. The rest could hardly be driven from the pond, and a small lot lighted with my live geese in a meadow about half a mile south.

I mention this to show that these geese had every indication of having met very unfavorable conditions for their journey. The warm wave continued through the next day, and the temperature on October 5 reached 85 degrees in Boston, almost a record for October. The strong southwest wind also continued.

I afterwards attempted to learn all that I could concerning the flight, and the following occurrences can be vouched for.

Chebacco Lake, Exsex County, October 3, one bunch of geese heard going over.

Accord Pond, South Hingham, October 3 and 4, two bunches (thirteen and sixteen) in the pond.

At Silver Lake, Kingston, on the same dates, bunches of fifteen, twenty-five, and eighteen in the pond, and about fifty flying.

In Robbins Pond, East Bridgewater, fourteen came to the pond.

In Jacobs Pond, Norwell, three flocks, thirteen, thirteen, and twenty-seven, were seen.

A few geese came into Duxbury Bay on the same flight, "possibly fifty."

At Ponkapoag Pond, Canton, one hundred and fifty were noted.

All these occurrences were during the same period as the flight mentioned for Wenham Lake.

Glancing now at the Canadian daily weather charts, we find, in brief, the following state of affairs.

Our geese must have started late on October 2, or early on October 3, as our record of 4 P. M., October 3 indicates. The charts show us a typical cyclonic storm moving northeastward, accompanied by moderate precipitation. On the 2d, at 8 A. M., it was over the Gulf of St. Lawrence, and on the 3d it is described as a severe storm in and about Newfoundland. On this date the winds were northwest, and from sixteen to fifty-two miles an hour at Newfoundland points, with heavy precipitation; while by the 4th the winds all along the coast were south, and of considerable strength.

The storm therefore passed north of New England, leaving rather high pressure and high temperature along the coast. Geese starting from eastern Labrador probably had northerly winds and low pressure, with some precipitation; while from southwestern Labrador they would also have had fair winds. In any case, this flight must have rather suddenly encountered adverse winds, with high temperature and pressure. It seems to me most likely that these facts account for the apparent exhaustion of the flocks noted at Wenham. Much more difficult is it to account for the start. If we knew the origin of the Massachusetts coastal flight, we might obtain a clue. One point of great interest, however, is the fact of an exceedingly early spring for 1910. If the date of inland ice departure is a fair criterion — and I think it is — I find for Moosehead Lake, Maine, that this date was 24 days earlier in 1910 than the previous four year average. The following information kindly supplied by the Maine Central R. R. tells the same story. "I am giving you below the dates the ice went out in the spring of 1910, which was an abnormal year, and some three weeks ahead of the usual schedule for that event. Sebago Lake, April 1. Belgrade Lakes, April 6; in 1909, April 26. Green Lake and other fishing waters on our Mount Desert branch, April 6. Grand Lake, April 10; in 1909 the date was May 6. The Rangeleys, April 18."

New England birds are known to have nested early in 1910, and the migratory waterfowl probably did also. In this connection, it is interesting to note that Canada Geese bred by me at Wenham in 1910 were flying the last week of July — an early date, though I can give no actual comparative ones.

The second flight that I wish to speak of was a delayed and much concentrated migration which began on November 28, after a long interval during which almost no geese were seen at Massachusetts points. In fact, it was the regular mid-November flight delayed about two weeks.

At Oldham Pond, South Hanover, on November 28, there was a northeast rainstorm lasting all day. Geese appeared at 8 A. M. Two bunches came into the pond; and four bunches, comprising about 225 birds, passed over. On November 29, 78 geese lighted in Oldham Pond, and thirty were seen flying. On November 30, 110 geese came to the pond, and 33 were noted flying; while on December 1 and 2 nearly 1000 geese were seen from the stand, and a few came to the pond.

At Clark's Island, Duxbury Bay, Dr. Rockwell Coffin tells me of the same remarkable flight. About 10 o'clock on the morning of November 28, geese appeared in great numbers. In three hours a rough count showed that 6000 geese had passed outside the bar; but none came into the bay until evening. For the next seventeen days geese were seen every day at this point. Other points noted great flights; at Accord Pond 1000 were seen on December 28, but, as most places do not keep records, they need not concern us. The above data are sufficient to show that there was a very large and suddenly developed migration.

Now, as to the meteorological facts in connection with this flight, the charts of November 26, 27, and 28 all show stormy conditions off the Atlantic coast, moving slowly eastward, and accompanied by strong northerly winds. There was considerable precipitation, especially in Newfoundland; and much of it must have been snow. The wind reached 48 miles an hour at Port au Basques on November 27, while on the same day the precipitation at Sable Island was over 1½ inches. Strong northerly to northeasterly coastal winds continued through November 28 and 29, while the temperature remained seasonable. Migrating geese might well have started during northwesterly winds, and later on encountered the storm area, and then followed the coast with a north or northeast wind. As noted in my first paper, these conditions do not seem to be especially unfavorable for migration, as witness the fact that only a small percentage of flocks stopped during the first of this flight.

The conditions which suddenly set in motion such great numbers of birds are all a mystery. Like many of these flights, the greatest volume seems to arrive with the front of the migratory wave; and the first flocks are less inclined to stop than those that follow later on.

I also made an attempt to find out just where the great flight seen off Duxbury bar crossed Cape Cod. Dr. Coffin is sure that none of the flocks which he saw on November 28 were Brant, as from his vantage point he had been watching Brant for weeks, and was armed besides with powerful glasses.

Some enquiries were made for me at various points east of Plymouth, from Manomet to West Barnstable, but at no place was more than about 1000 geese noted in any one day. West Barnstable pond gunners reported more geese than for many years, and large numbers were seen at Manomet Point and Great South Pond, Plymouth. The same story was obtained as to an unusual flight during the last of November and early December at Great Herring Pond, Plymouth, Mashpee Lake, Mashpee, and Mystic Lake, Barnstable. Hence it seems certain that more geese crossed east of Buzzard's Bay than is usually the case. It also appears that the great Plymouth flight of November 28 must have dispersed somewhat as it reached land, because no other points, as far as I have been able to learn, witnessed such a concentrated migration.

A STUDY OF THE NESTING OF THE CEDAR WAXWING.

BY ARETAS A. SAUNDERS.

PROBABLY all our accounts of the life history of the Cedar Waxwing (*Bombycilla cedrorum*) mention the flocking habits of this species. Most of them also include the statement that during the nesting season this habit ceases and the birds separate in pairs. In my own experience, however, the flocking habit often continues throughout the nesting season, the nests being placed, if not in actual colonies, at least in close proximity to each other, and the nesting birds often congregating in small flocks. One of my earliest bird-nesting memories is that of finding a number of Waxwing nests in the same apple orchard. In August, 1906, however, I found the best illustration of this habit I have seen, when I discovered ten nests of the Cedar Waxwing in a small tract of about five acres. These nests, with one other about half a mile distant, were well located to watch, and I had plenty of spare time so that in the next few weeks I made many notes on the nesting habits of this species, which form the basis for this paper.

The nests were located at Woody Crest, a small shore resort of West Haven, Conn. The tract of ground was flat, somewhat swampy and covered with a second growth of red maple and chestnut sprouts about ten or twelve feet in height. In addition to the Waxwing's nests, I found on the tract three nests of the Goldfinch and two of the Indigo Bunting. Besides these I found many empty nests which showed that Robins, Catbirds, Brown Thrashers, Red-eyed and White-eyed Vireos, Yellow-breasted Chats, and Maryland Yellowthroats had nested there earlier in the season. The Waxwing nests were placed in red maples from five to ten feet above the ground. This is much lower than the species usually nests, probably because of the lowness of the bushes themselves. It was noticeable that each nest was placed as high as the bush, in which it was located, permitted. The nest located half a mile away, was in much higher cover and was fully twenty feet above the ground.

The composition of the nests was quite variable, but this variation seemed to be due more to the location of the nests than to the individual tastes of the birds. Thus two nests that were placed in bushes close to a large patch of sphagnum moss, were largely composed of that material, while other nests, not twenty feet away, but not easily accessible to the moss, had none whatever in them. The average nest was composed of grass and strips of bark with a lining of fine grass and plant fiber. Other materials used were roots, leaves, ferns, weed stalks, twigs, chestnut blossoms, and string. All these materials, except perhaps the string, could be obtained close to the nests. This bird appears to have a strong liking for string. In late June, 1907, I watched a pair of Waxwings pulling string from an old Oriole's nest, which they carried to a maple about fifty feet away where they were building their nest. This is the only opportunity I have had to watch nest-building by this species. In this case both birds took part in the building, but one bird, presumably the female, was much more active than the other.

All of the nests found in the thicket were discovered between August 20 and September 14, and all contained either eggs or young. The number of eggs or young was three in four cases and four in four others. In the other three nests it was not determined. Four nests were found before the complete sets were laid. Two of these were deserted, apparently because of my intrusion, and these two were the only nests of the eleven that failed to successfully rear a brood of young. A curious incident happened in one of these nests. When I found it, it contained a single egg which was partially imbedded into the bottom of the nest. The next day the nest was empty and I supposed the egg had been taken by some animal or bird, though I could not find a hollow place in the bottom, where the egg had been imbedded. Nothing further happened to the nest and about a week later I took it down and examined it. I was surprised to find the one egg sealed into the bottom. Apparently the bird had sealed up its egg and then deserted the nest.

The two undeserted nests which had contained incomplete sets of eggs were carefully watched. In both cases the remaining eggs were laid daily and the period between the laying of the last egg and the hatching of the young was twelve days. I watched incubating birds for some time and so far as I could tell, only the female performs this duty.

After the young hatch the female broods closely for several days until they become partially feathered and the eyes begin to open. During this time she seldom leaves the nest and never for more than an hour at a time. After this she broods but little in the daytime but continues to brood at night until the young are about twelve days old. I believe the male does not brood at all.

Both birds feed the young, but during the first few days when the female is brooding the male does most of it. When he comes to feed the young, the female leaves the nest for a few minutes, but returns as soon as he has gone. In all cases these birds are very slow and deliberate in their movements about the nest. They take a long time to approach the nest, feed the young, and leave again, during most of which they stand perfectly still between movements, with the neck stretched, the bill pointed upward and the crest lying flat on the back of the neck. I watched the nests seated on the ground some ten or fifteen feet away. The slow movements may have been because of my presence, but I doubt it, for the birds did not show anxiety or uneasiness in any other way and in fact, I believe did not notice me at all, except when I was actually examining the nest and its contents. In approaching the nests, the birds would fly into the bush from whatever side they happened to come, sit on the lower limbs for a time, then approach the nest by short upward flights. After a long wait sitting on the nest rim, they would feed the young by the usual method of regurgitation, and then take another long wait before flying away. Each bird always left the nest in a certain direction. The birds were so regular in this that after a little observation at a given nest, I could distinguish the sexes by the direction in which they left the nest. At one nest the male bird always left flying straight toward where I sat and usually passed three or four feet over my head, not paying the slightest attention to me.

The birds feed the young only at long intervals, rarely as short as fifteen minutes and usually of from three quarters of an hour to an hour or more. Feeding, in every case that I watched, was by the method of regurgitation common to this species, which has been so well described by other observers. I believe, however, that the young are occasionally fed directly by food from the bill which has not been first swallowed by the parent. Once, as I approached a nest, I saw a Waxwing near it with a spider in its bill, which it was evidently about to feed the young. I saw it too late to stop myself, however, and frightened the bird off by my close approach. I believe that the method of feeding from the throat is not true regurgitation but is merely a convenient method of carrying more food at a time than could be taken in the bill, and accounts, in part at least, for the long intervals between feeding. The food, which in my observations was principally wild cherries, was never mashed or digested in any way, but was fed to the young whole, stones and all.

The parent birds from the different nests made trips for food in small flocks, usually of four or five. The cherry trees where most of the food was obtained grew along the shore about a quarter of a mile from the nests. The small flocks usually gathered in the tops of a few dead stubs that stood above the thicket, and left these in a body for the cherry trees, returned in the same manner when the food was obtained and then scattered slowly to their respective nests.

The birds were rather irregular about cleaning their nests and individuals differed considerably in this respect. Small undigested parts of the food of the young, such as the cherry stones, often remained in the bottom of the nests, and it was by examining the nests after the young had left that I obtained the most information concerning the nature of the food. Stones of the wild cherry (*Prunus serotina*) were most abundant. With them were usually a few seeds of the pokeberry (*Phytolacca decandra*) and the chokeberry (*Pyrus arbutifolia*), wing cases of beetles, small snail shells, and pebbles. The latter two were evidently obtained along the shore and were always smaller than the cherry stones. The snail shells had the appearance of the sun-bleached empty ones found above high-water mark, rather than those of live snails. Both shells and pebbles had evidently passed through the systems of the young, but why the birds should feed empty shells and pebbles to the young is rather a mystery and I would not have mentioned my suspicion that this is so, were it not strengthened by other observations. Twice I saw a Waxwing on the shore above high-water mark near the cherry trees. In both cases the tide was too high for it to obtain live snails, but each time I frightened the bird away before I could see what it was doing.

I kept careful watch of the growth and development of the young Waxwings. In only three of the nests did I ascertain the exact date of hatching, but I was able to get the age of the other broods approximately by comparison of their development with that of the broods whose age I knew. These three broods left the nest, one in fourteen, one in sixteen and one in eighteen days. The other broods all left when they were approximately sixteen or seventeen days old. The young when born are perfectly naked, without the natal down found in most young birds. The first few days they grow in size only. By the fourth day a row of small black pimples shows along the middle of the back where the first feathers are starting through. In six days the feathers of the back and the wing quills come through and pimples begin to show on the breast. By seven or eight days the eyes begin to open and more pimples appear on top of the head. In eight or nine days the head and breast feathers appear, the feathers of the back begin to break their sheaths and pimples appear on the throat. By ten to twelve days the throat and tail feathers appear, the wing quills and head feathers break their sheaths, and the creamy white streak above the eye, a mark of the young bird only, begins to show plainly. By twelve to fourteen days the eyes are wide open and all the feathers are unsheathed or unsheathing except those forming the black patch on the forehead and about the eyes. These feathers are last of all to appear and do not break the sheaths till about the fifteenth day or later, sometimes after the young have left the nest. This fact appears to have led some writers to state that young Waxwings do not have this black mark. By fourteen to eighteen days the young are fully fledged and leave the nest shortly, being able to fly a little as soon as they leave. For a few days after leaving they may usually be found in the vicinity of the nest, the whole brood perched together in a row, with necks stretched and bills pointing up in the air in the same manner as the adults.

The difference in the development of the different broods was evidently due to a difference in frequency of feeding by the parents. The brood leaving the nest in fourteen days was fed often for this species, every fifteen minutes, at least during part of the day. The brood leaving in eighteen days was fed on an average of about once an hour. The last brood left the nest on September 20.

Late in November, after the leaves had fallen, I visited the thicket again to see how many Waxwing nests in all were there. I found seven more nests evidently of this species, making a total of seventeen. These other nests were some distance from the ones I studied and much more scattered. All of the seventeen, however, could be included within a radius of 150 yards.

The next year I was away from this vicinity most of the summer but returned in September. On September 21 I visited the thicket again to see if the Waxwings had been there that summer. After a long search I found two nests, both empty, but one with a parent bird and brood of four young sitting in the bush above it. This was just one day more than a year since the last brood of the year before had left the nest. The birds were there but not in the same numbers as the previous year. Evidently Waxwings do not necessarily return to the same locality in which they have nested before.

It is evident that the presence or absence of Waxwings in a given locality is due to the abundance or lack of a supply of the berry or fruit that forms the major part of their food. A later experience in the vicinity of Bozeman, Montana, confirms this. During the summer of 1908 there were no Waxwings that I observed in the vicinity of Bozeman. The next year, however, they appeared in June and were abundant throughout the summer. During this time I found two Waxwing nests in shade trees along the streets of Bozeman and could doubtless have found many if I had had time for search. In this region the service berry (*Amelanchier alnifolia*) forms the principal article of food. This berry was very abundant about Bozeman in 1909 and correspondingly scarce in 1908. During the summer of 1910, in a few short visits to Bozeman, I again found Waxwings quite common and service berries fairly abundant.

NOTES ON THE MIGRATION OF THE SAW-WHET OWL.

BY P. A. TAVERNER AND B. H. SWALES.

FROM all written accounts it appears that the Acadian, or Saw-whet, Owl (*Cryptoglaux acadia acadia*) is generally regarded as a resident wherever found or that, if it migrates at all, it is but slightly and the movement is limited to the northern and southern extremes of its range. This view is reflected by the citations from the following authors.

Wilson. "This species is a general and constant inhabitant of the Middle and Northern States."[1]

A. K. Fisher. "The species is not migratory but is more or less of an irregular wanderer in its search for food during the fall and winter."[2]

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[1] Wilson. American Ornithology. Brewer ed., 1840, 310.

[2] Fisher. Hawks and Owls of the United States in Their Relation to Agriculture, 1893, 161.

Coues. "Fitted to endure great cold, it is resident in our northern districts."[1]

Bendire. "It is a constant resident throughout the greater portion of its range within the United States, only migrating from its more northern breeding grounds and passing the winter mainly in the Middle States where it is met with at times in considerable numbers."[2]

Nuttall. "In the United States it is not uncommon as far south as Pennsylvania and New Jersey where it is resident."[3]

Other authorities could be quoted but the above is sufficient to show the general trend of opinion on this subject. Some of our late experiences, however, in southern Ontario and adjoining territory, have caused us to alter our mind on the residential status of this species and we believe that it migrates more extensively and generally than has heretofore been supposed.

The fact is, that our recent observations at Point Pelee have induced us to believe, that in resident species, migration is the rule with its component individuals rather than the exception. The mere accident that the northern limit of the winter range overlaps the southern limit of the summer range is no indication that migration is not the fixed habit of every individual of the species even though the movement is not observable, because as summer birds leave and winter ones from the north come in, the average population remains unchanged and the movement therefore unnoticed.

The first indication we received of any strong migratory movement in this species was when W. E. Saunders of London, Ont., received word from Mr. Tripp of Forest, Ont., of a migration disaster on the shores of Lake Huron, October 18, 1906. His investigation of this occurrence was reported in 'The Auk'.[4] He discovered the shore of the lake in the vicinity of Port Franks covered with the water-washed bodies of birds that had been overwhelmed in a storm, likely while crossing the lake; and though he covered but a small portion of the affected territory and did not touch upon its worst part, he counted 1845 dead birds in two miles of shore. Here was evidently a disaster that overcame a large movement of mixed migrants but the salient fact in this connection is, that he counted 24 Saw-whet Owls among the debris. Mr. Saunders is, and has been for the last twenty-five years, a most keen and enthusiastic field worker, but in summing up his experience with the species, says: "The Saw-whets were a surprise. They are rare in western Ontario, and one sees them only at intervals of many years, evidently they were migrating in considerable numbers."

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[1] Coues. Birds of the Northwest. 1874. 316.

[2] Bendire. Life Histories of North American Birds. Vol. I. 1892. 350.

[3] Nuttall. A Popular Handbook of the Ornithology of Western North America Chamberlain ed., Vol. I. 1872. 72.

[4] Saunders. Auk. 1907. 108-110.

A statement elicited from the captain of the fish boat 'Louise' of Sandusky, Ohio, bears very closely upon this subject. He says, that about October 10, 1903, when on the steamer 'Helena,' off Little Duck Islands, Lake Huron, he saw a large migration of small owls and that many of them lit on the steamer. His description tallied very well with that of this species and there is the probability that it was a relay of this same migration that was so hardly used in 1906.

We were unable to include this species in our List of the 'Birds of Point Pelee,'[1] having at the time of publication (1906–07) no satisfactory record of its occurrence there, though we had often looked for it. In an adjacent and quite comparable station, Long Point, on Lake Erie and sixty miles to the east, we had heard that Saw-whets were at times captured in numbers by stretching old gill nets across the roads in the woods. The birds flying down the clear lanes became entangled in the meshes and thus caught. This was received from what seemed good authority and backed by so many specimens that we had decided to use the expedient in discovering the presence of the species on the Point. However, October 30, 1908, Swales, while working the Red Cedar (*Juniper virginiana*) thickets near the outer end of the Point discovered the fresh remains of two birds of this species. Later the same day Saunders found another in the same condition, and November 22 he found two fresh and several older remains. At the time, seeing the great devastation wrought to bird life by the Cooper

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[1] Taverner and Swales. The Birds of Point Pelee, Ontario, Wilson Bulletin. 1907–1908.

Hawks, as shown by the numerous bunches of feathers scattered over the ground, we attributed the fate of the Saw-whets to this source; but even then we could hardly help wondering that this day-flying hawk could so successfully hunt such a secretive bird, living, as it naturally would during the day, in the dense masses of cedar where we had, by repeated observation, been led to suppose a bird was safe from hawk molestation.

The mystery, however, was cleared up, to our satisfaction at least, this last fall, October 15, 1910. While looking for warblers in these same red cedar thickets, Taverner discovered, by aid of the scattered plumage, the spot where another of these owls had met an untimely fate. With this incentive, we made a careful search that shortly resulted in Swales discovering what we looked for, half way up a small cedar and about seven feet from the ground. This he secured, but we had hardly properly papered the specimen for carrying when another was seen eating a mouse. On finding itself observed, it rose high up on its legs, leaned forward, and glared at the intruder, still holding the body of the mouse in its bill, exhibiting no fear and only evinced anxiety by following every movement with its golden eyes. Within less than two hours, and in a small part of the thickets, we discovered twelve of these owls. We looked carefully for the young, the *albifrons* plumage, but without success.

All birds seen were alert and the majority in the densest red cedar clumps. Most of them were close up against the trunk of their respective trees, and usually about six feet from the ground, the highest being about twelve feet, and the lowest four. None showed any fear. But one flushed, and that was only when the tree it was on was jarred in our passage; even then it flew but a few yards and allowed our close approach. None uttered any sound except the usual owlish snapping of the bill. We collected what we thought was a moderate number and returned to camp for a camera with which we returned later.

We separated on reaching the owl grounds and in about five minutes both had located owls. Taverner immediately set up the instrument to photograph his, but the situation was bad and a jar of the branch it was on, frightening the subject, it flew away and was not followed, but the paraphernalia was taken over to where

Swales was watching his specimen. The bird was rather high up and in the shade, and a couple of attempts were made to get a picture without satisfactory results. The camera was too low to get what we wanted so we spliced dead branches to the legs, using what was lying around handy for material. The straps from the carrying case and field glasses, three handkerchiefs, and the strings of a tobacco bag furnished the binding materials and the whole made an exceedingly wabbly stand, but it visibly raised the lens to an approximate level with the bird. With this bundle of apparatus we again tried, and drawing closer and closer we got the subject on the plate and finally made the exposure. Having got what we thought to be the best possible results, we experimented a bit to see how close the bird would let us approach. We got right under it by degrees and then raised our hand until it was even with it, and touched the branch at its side upon which it stood. Finally Swales attempted to stroke it on the back, but this was more than it would stand and it flew, but only a few feet, and lit on a horizontal branch almost in the open and in good light. The camera tripod was hurriedly restored to its former lengthy but wabbly condition, and with the front lens combination removed and the bellows extended to its farthest extent, an exposure of nine seconds was made. This was the only picture that proved really satisfactory, being the only one in which the instrument had remained steady. The seance ended in another attempt to touch the bird, and as it was getting late, we returned to camp.

Through the night we listened carefully for the peculiar call that gives the species its name, but without result. We were too busy with our specimens to go out the mile or so that separated us from the ground where we had found them, and we heard none nearby. The next morning we started out early to give Saunders a chance to see the remarkable sight, as he had been working another part of the Point the day before. We worked the whole end of the Point with great care, but except for the scattered remains of another unfortunate, saw not a sign of them. They had evidently departed in the night.

We saw in all, twelve birds; eight were found by diligent search, and the remainder we just ran on to. They were all quiet and so near the color and contour of other natural forms as to be most inconspicuous. We covered but a small portion of the available likely-looking ground, and were actively searching not more than two hours. If our eyes picked up one quarter of those in sight we did well, and if the whole available territory was at that time as densely populated with Saw-whets as the small portion we worked, the total number of this rare species on the Point must have been very great.

There were very few Accipitres about this time, but there were accompanying the Saw-whets quite a number of Long-eared and Short-eared Owls. Allowing for repeated observation of the same individual, we saw six Long-eared and two Short-eared Owls. Beyond doubt, these larger and close relatives were the offending parties as they would be hunting at night at the only time when, in their foraging, the Saw-whet would be open to attack; and it is suggested that it is due to the depredations of the Long-eared Owl, which generally hunts the same thickets, that this beautiful little owl is so regularly rare as it is.

Here, then, are records of four migrational massings of this hitherto supposed resident owl. It was too early in the season to explain their gathering as "winter wandering in search of food," and the close tallying of all the dates point to the conclusion that from the middle to the end of October the Saw-whet Owls migrate in considerable numbers, but from their nocturnal habits and secluded habitats while en route are seldom observed. In all probability, too, such noticeable gatherings are only to be observed in such places as at Point Pelee where a constricted migration route brings many together at one time. Long Point is another place much like Pelee in this regard, and the Lake Huron episodes likely originated in other fly lines across that body of water and of which we as yet know nothing.

THE ENGLISH SPARROW AS AN AGENT IN THE DISSEMINATION OF CHICKEN AND BIRD MITES.

BY H. E. EWING.

Observations.

During the summer of 1905, while the author was engaged in making collections of various external parasites near Arcola, Ill., a large hay-barn was found in which a multitude of English Sparrows had nested. From the roof of the barn there extended upward a large cupola, the inside of which soon proved to be perfectly alive with sparrows. Numerous nestlings were found, either concealed in the some score of large, trashy nest-bundles, so characteristic of the species, and which occupied the various recesses and corners of the wooden structure, or, being now almost full-fledged, had fluttered out of the nests whence their ill spent attempts at flight had caused no small amount of concern on part of the parents. However, as is not usually the case, the sparrows evidently did not have complete possession of this veritable hatching house for their species for a few pigeons had also shared with them the use of this structure, and an examination revealed some three or four nests of these. Luckily for us collectors the cupola was provided with a trap door, so after entering the structure we were enabled to capture several of the live birds and examine them for parasites. None of these birds were killed, but a perfectly enormous number of parasites were secured, and among them was found a very great number of what seemed to be the common poultry louse, or chicken mite, *Dermanyssus gallinæ* Redi. Later studies have fully established the correctness of this offhand determination.

Since the sparrow has been recognized for some time as being one of the many hosts of an allied species (*Dermanyssus avium* DeGeer), for a long while I was inclined to doubt that this mite was the real mite of poultry, yet the near proximity of the hay-barn to a chicken-house, which at least for some years had been known to be infested with the chicken mite, strongly suggested to me the probability of this species being the one found on poultry.

During the summer of 1909, while a graduate student in the University of Illinois, I took up the study of these two species of mites mentioned. Arrangements were made with a couple of students to get me the sparrows, but they were unable to get many individuals. However, the author continued to collect what data there was to be obtained both at Urbana and Arcola, Ill. One day, to my surprise, a sparrow was found that had fallen upon the grass of the campus, and upon examination it was seen to possess scores, if not hundreds, of *Dermanyssi*. The individual was weak, sickly, and exhausted, and evidently would soon have died from the effects of the attacks of these scores of mites. The bird was killed, however, and the mites collected. Examinations of these specimens later showed that they were no other than *Dermanyssus gallinæ* Redi (Fig. 1), our common chicken mite. The work at the University was not completed, because as yet I had failed to get any accurate and reliable characters for the distinction of these

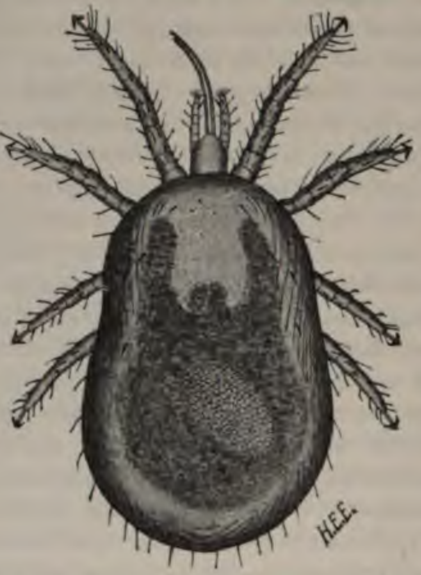

Fig. 1.— *Dermanyssus gallinæ* Redi, the common chicken mite of poultry-houses. Dorsal view of female, much magnified.

two closely related species of mites, although I had consulted all the literature available on the subject. Right here, it might be mentioned, that these two species are and have been constantly confused in the literature dealing with each of them.

During the summer of 1910, while at Ames, Ia., frequent reports came in, both from the town of Ames and from other points in the State, of the seriousness of the attacks of the chicken mite upon poultry. An investigation and inquiry in regard to the number of chicken-houses infested showed that while several were perfectly free from the chicken mite many were badly infested. On August 11 a rather large and recently deserted nest of the English Sparrow was found in an old wagon shed entirely separated from any adjoining buildings. This nest was procured and upon examination was found to harbor hundreds, even thousands of the chicken mites. Every feather found on the interior of the nest had scores of mites upon it. A medium sized feather which appeared to be only moderately infested proved to have 72 individuals

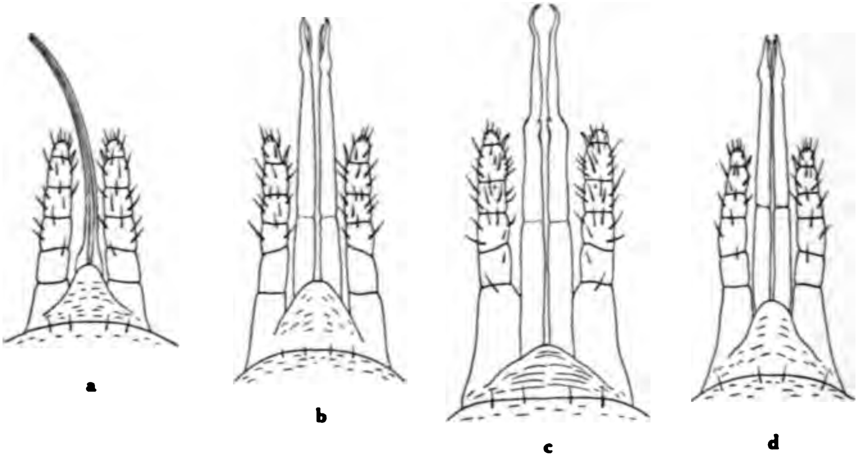

Fig. 2.— Mouth-parts of both males and females of the chicken and bird mites: all of the same magnification. *a.* Dorsal view of the mouth-parts of the female of the chicken mite, showing the long needle-like mandibles protruded. *b.* The same of the female of the bird mite. *c.* Dorsal view of the mouth-parts of the male of the chicken mite, showing the one long specialized arm of the chela. *d* The same of the male of the bird mite.

upon it. The number of feathers thus used in the construction of the nest was at least more than 200. I estimated them at 250. Multiplying this number by the number of individuals found on a single feather would give the total number of 18,000 individuals of the poultry mite found in only a single nest of the sparrow.

This case, though the worst found, will give some idea as to what are the possibilities of infestation of a chicken house or roost by means of the sparrow; and of the annoyance which these mites may give to other fowls or domestic animals, and, as I have found in one case, to man himself, when the mites are compelled to leave an abandoned sparrow nest and begin to wander and seek food elsewhere.

The Differences between the Chicken Mite and the Bird Mite.

After studying some scores of mounted specimens, and after observing hundreds of live individuals of both of our common species of *Dermanyssus*, the author submits the following characters which are amply sufficient to separate the two:

Dermanyssus gallinæ	*Dermanyssus avium*
1. Mandibles of the female very long and needle-like, not chelate (Fig. 2, *a*). [By dorso-ventral pressure they may be protruded.]	1. Mandibles of female very slender but not needle-like, and seen to be distinctly chelate (Fig. 2, *b*).
2. Mandibles of male, seen to be chelate, but one of the arms of the chelæ especially long drawn out and curved (Fig. 2, *c*).	2. Mandibles of the male, normal, and not differing essentially from those of the female (Fig. 2, *d*).
3. Females becoming, at times, much larger than the males, often as much as three times, due to engorgement with blood. Length may be over 1.00 mm.	3. Females but little larger than males. Never over 1.00 mm. long.

Inoculation Tests.

Some time previous to the finding of the badly infested sparrow nest, a healthy young chicken was procured for experimental purposes. This chicken was kept in a large, clean goods box for a cage. On July 20, 50 individuals of the bird mite, *Dermanyssus avium* DeGeer, were placed upon the chicken in the cage. These mites were taken from a young robin; plenty of them were also found on sparrows and mourning doves. On the 24th, four days later, a careful examination was made of the chicken, but not a single one of the mites were to be found. The same results were obtained on the 28th and again on August 2. On August 11, three weeks after the original inoculation, not a sign of a mite could be found either upon the chicken, or in the cracks of the box, although if the chicken should have been a natural host to the bird mite, every opportunity for the establishment of the species would have been at hand.

On August 11, the chicken was now inoculated with individuals of *Dermanyssus gallinæ* Redi, taken from the sparrow nest. An examination on the 12th and 13th showed the chicken to be covered with the mites, many of which were next to the skin and feeding. The mites continued to feed upon the chicken and multiplied by the hundreds, even thousands. In the cracks of the box and in old knot-holes they could be found sometimes a quarter or half inch deep. During this time the chicken had become greatly annoyed, and at times would be almost constantly busy scratching itself with its bill. It lost weight rapidly, and became very sickly in appearance.

On August 20 many of these mites were taken from the chicken and used to inoculate an English Sparrow which had been kept in confinement, and was free from *Dermanyssus gallinæ* Redi. The mites at once began to annoy and feed upon the sparrow. In fact their attacks became so vigorous that the bird soon succumbed, and upon examination after death, before it had become cold, many individuals were found upon its skin and feeding.

Having thus established the fact that the mites found in the sparrow's nest could be inoculated upon the chicken, that the same mites after feeding for a long period upon the chicken could again be inoculated upon the sparrow, I made some observations for testing the ability of *Dermanyssi* to travel when off of a host, and upon the length of time which they could live when entirely without food. Many individuals of *Dermanyssus avium* were confined in a small glass cell entirely without food. They apparently did not suffer from the abstinence for at least two days, and upon an examination four days later, several individuals were found to be yet alive.

Individuals from both species when placed on the top of a clean table could be found ten minutes later on the floor and at a considerable distance away. Thus within a period of four days it would be seen that these creatures could travel for no inconsiderable distances, as they evidently do when food becomes scarce. From this it would follow that chickens nesting in barns, outhouses, in chicken coops placed near the bases of trees, or in hen-houses in which sparrows were allowed to build would be especially subject to inoculation from the deserted sparrow nests.

SUMMARY.

1. The English Sparrow frequently harbors and is the host of one of our worst, if not the worst, of poultry pests, the chicken louse or chicken mite, *Dermanyssus gallinæ* Redi.
2. Sparrows become repeatedly inoculated with these mites from the chicken roosts because of their habit of lining their nests with poultry feathers, many of which have lice upon them, shaken off of the infested chickens when wallowing in the dust, etc.
3. Sparrow nests when built in the vicinity of chicken roosts, upon becoming deserted may leave hundreds or thousands of lice, to seek food and shelter elsewhere. These individuals being very active on their feet and able to sustain themselves for several days away from a host may travel considerable distances and infest new chicken-houses.
4. The English Sparrow likewise harbors and is the host of perhaps the most important of all the external parasites of our native song birds, and likewise of our tamed cage birds, the bird mite, *Dermanyssus avium* De Geer.

THE COURTSHIP AND MIGRATION OF THE RED-BREASTED MERGANSER (*MERGUS SERRATOR*).[1]

BY CHARLES W. TOWNSEND, M. D.

The Red-breasted Merganser or Sheldrake, as it is commonly called on the New England coast, is an interesting and at some seasons an abundant bird. Like the Whistler and the Eider,[2] this duck has a spectacular and distinctive courtship display.

The nuptial performance is always at its best when several drakes are displaying their charms of movement, voice and plumage, before a single duck, and each vies with the other in the ardor of the courtship. The drake begins by stretching up his long neck so that the white ring is much broadened, and the metallic green head, with its long crest and its narrow red bill, makes a conspicuous object. At once the bill is opened wide and the whole bird stiffly bobs or teters as if on a pivot, in such a way that the breast and the lower part of the neck are immersed, while the tail and posterior part of the body swing upward. This motion brings the neck and head from a vertical position to an angle of forty-five degrees. All the motions are stiffly executed, and suggest a formal but ungraceful courtesy.

For many years I have seen this performance more or less imperfectly in the spring, but, owing to the distance of the birds or the direction of the wind, I have been unable until recently to hear the nuptial song that the open mouth of the bird led me to expect. On April 19 last, however, the conditions were most favorable, and, in company with Mr. Francis H. Allen, I not only saw but heard the courtship performance repeated many times at Ipswich. Concealed behind some bushes at the foot of Castle Hill at the mouth of the Ipswich River with a gentle wind blowing towards us, we watched and listened to the birds within two or three hundred yards of us for over half an hour. Again on April 30 I had a similar but less favorable opportunity. My notes of the nuptial movements correspond with those taken several times before when the birds were seen performing off the beach, but when, owing to the distance and the roar of the surf, their nuptial song had been inaudible.

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[1] Read before the Nuttall Ornithological Club, May 15, 1911.

[2] Auk, XXVII, 1910, pp. 177–181.

This *song*, emitted when the bill is opened, is a difficult one to describe, but easily recognized when once heard, and remains long in the memory after one has heard it repeated over and over again by a number of Merganser suitors. It is a loud, rough and purring, slightly double note which I wrote down *da-ah*, but the note is probably insusceptible of expression by syllables.

The bobbing and the love-note may be given twice in rapid succession although at times the performance is a single one, or may consist of an extensive bob, preceded by a slighter but similar one. The performance is, however, repeated at frequent or infrequent intervals, depending on the ardor and number of the suitors, and, no doubt, on the attitude of the modestly dressed lady.

Although the female merganser may remain passive and coyly indifferent, as is the habit of her sex, she sometimes responds by a bobbing which is similar to that of the male, but of considerably less range. That is to say the neck is not stretched so straight up, and the breast is not so much depressed during the bob. She emits a single note at this time, which is somewhat louder than that of the male and is of a different quality as it is decidedly rasping. As nearly as I can remember this note is similar to the rough croaks I have heard given by these birds in Labrador when they were flying to and from their nests.

When the female responds in this manner she appears to be very excited, and the ardor of the drakes is correspondingly increased, if one may judge by the frequent repetition of the love antics and notes, and by the fact that they crowd about the duck. Every now and then she darts out her neck and dashes at the ring of suitors, just as the female English Sparrow does under similar circumstances.

The bobbing up of the stern of the male is the more conspicuous as the wings are then apparently slightly arched upwards, so that the white secondary feathers are very prominent. These show at all times as the male swims in the water, but in the female they are generally but not always invisible.

During the courtship actions the tail is elevated at an angle of forty-five degrees, and it may or may not be widely spread at the same time. In one case the male kept the tail permanently erected and spread during the intervals as well as during the actual antics. This bobbing courtship of the males, although sometimes directed towards the female, is as often directed towards another male or even the empty water.

The males not infrequently rush at one another with powerful leg-strokes making the water foam about their elevated breasts. Sometimes they raise their wings slightly or splash along violently using both wings and feet for propulsion. Now and then a male pursues a female, and she, to avoid capture, may dive and is at once followed by the male. In flight the female generally precedes by a short interval the male. Out of fifteen pairs observed in flight on April 20, 1907, in twelve the female flew first. In Labrador I found this sequence was the rule among courting Eiders except when the pair were startled, when the drake ungallantly outsped the duck. As far as I have observed there is no display of the feet with the accompanying spurting of the water as in the case of the Whistler.

The positions often assumed by Mergansers, both male and female, with the neck stretched flat along the surface of the water as they swim, and with the bill partially immersed as if they were straining the water for food, or with all of the head below the water except the crest as if they were looking for fish, are, I believe, not parts of the nuptial performance and are common at all seasons. So also the momentary erect position with flapping wings is common at all times of the year, although its advantages for display leads me to think that at times it forms part of the courtship actions. This is especially the case when the bird rises up, as he sometimes does, with wings close to the side, and recalls the similar actions of the Eider in displaying his black belly-shield.

The migration of the Red-breasted Merganser is an impressive one on account of their numbers, but there are some interesting points in the distribution of the sexes and of the immature birds and adults that are well worth study. I am inclined to believe from an examination of the figures in my records for the last ten years that this bird has of late considerably increased in numbers.

The largest number I ever saw at Ipswich was on October 23, 1910, when Mr. F. H. Allen and I estimated, and we believe conservatively, twenty thousand Red-breasted Mergansers off the beach. Better enforcement of the game laws, and especially the establishment of a close season in the late winter and spring, are I believe the chief reasons for this increase. I am also of the opinion that we owe a great deal to M. Meunier, the great French chocolate king, for his exclusion of guns from the island of Anticosti, which has become his property,— an island that thus forms a splendid breeding sanctuary for Mergansers, Black Ducks, Yellow-legs and other water birds.

The Red-breasted Merganser does not breed in Essex County, but it is not uncommon to find two or three birds, presumably sterile, throughout the summer at Ipswich. The species begins to arrive from the north the last of September, and becomes common and then abundant in October. The great throngs of birds in this month appear to be made up almost exclusively of birds in the female or immature plumage. In the latter part of the month and in November many are to be seen changing into the beautiful dress of the adult male, while by the last of December and throughout January and February it is comparatively rare to see a bird in female attire. Thus on January 24, 1904, out of some five hundred Mergansers I could count only six in the female plumage. In March the females put in an appearance, and courting begins, and by the last of April and in May the birds are largely paired, although flocks of either or both sexes are common. Many of the birds remain late in May before migrating for the north. Thus on May 14, 1905, I saw 200 Red-breasted Mergansers at Ipswich, 42 on May 20, 1904, and 32 on May 26, 1907. Some at least of the immature males are slow in changing to adult plumage, and males in nearly complete immature dress with only a few greenish feathers about the head are seen and have been shot in April and May. Whether these birds complete the nuptial moult that year or not until the next year I am unable to say.

So much for the plumage and sexes of the birds at the various seasons. In numbers they are the greatest in the latter part of October and in November. In December, January and February they are fairly constant in numbers but considerably less than in the fall, while in the spring their ranks again increase but never equal the multitudes of the fall.

The explanation of all this is interesting and I believe sufficiently apparent. The great flocks of birds in the fall in somber plumage are made up of immature birds, of adult females, and of the adult males in the eclipse plumage. In November the adult males moult into the nuptial plumage, while the females and young leave for the south, so that during the winter months practically all the birds are adult males in full plumage. Whether the exceptions are females or immature males or both I cannot say. In March and April the females return from the south as well as the immature males, which have not moulted into adult plumage, together with some adult males.

The southern side of this picture which rounds out and corroborates my northern observations has been given me by Mr. Wm. Brewster who said that in Florida in winter he had seen large flocks of female and immature Red-breasted Mergansers, and by Mr. Arthur T. Wayne, who, in his 'Birds of South Carolina,' 1910, page 13, says of this species: "From the time when these fish-eating ducks arrive until the first week in February the adult drakes are seldom, if ever, seen, but towards the second week in February they make their appearance in large numbers."

The old males brave the rigors of the northern climate, while the females and young seek warmer regions during the winter, but it would seem as if some of the impatient suitors were unable to await the return of their partners from the south, and must needs go and fetch them.

OTHER EARLY RECORDS OF THE PASSENGER PIGEON.

BY ALBERT HAZEN WRIGHT.

SINCE the appearance of the first article,[1] under a similar caption, the author has felt we should strive to assemble all the material extant concerning this extinct or near-extinct species. A systematic endeavor has been made to peruse most of the North American historical sources (county and town histories omitted) which would presumably yield notes concerning this form. No doubt this supplement will be far from complete from the biological point of view, but this and its predecessor are meant to be side-lights to the customary ornithologic literature from which we have not drawn. Of the period after 1860, many older ornithologists can speak from personal experience far better than the writer, hence the omission of such material.

If the laudable quest for survivors of the species prove not forlorn, we trust our boasted humanity will hold the protection of this beautiful bird to be a most sacred trust,— an attitude rarely taken in the day of its abundance. Immediate desires and absolute thoughtlessness reigned supreme so that cases like the temporary insanity of J. B. Booth, the actor, and the extreme solicitation of Thomas L. McKenney, the traveller, were unfortunately held up to ridicule rather than admiration.

In the first instance, Booth while acting in Louisville (Jan. 4, 1834), wrote James Freeman Clarke [2] asking if he could help him to find "a place of interment for his friend (s) in the church-yard." Clarke went immediately to Booth. Upon inquiries concerning his friend, the actor apparently changed the subject and proceeded to read Coleridge's 'Ancient Mariner,' following this with remarks on Shelley's argument against the use of animal food. Then, he argued his point by "texts selected skillfully here and there from Genesis to Revelation." At last he inquired if Clarke "Would.... like to look at the remains?" And, imagine Clarke's surprise when he beheld, "spread out upon a large sheet," "about a bushel of wild pigeons." "In a day or two," Booth "actually purchased a lot in the cemetery, two or three miles below the city, had a coffin made, hired a hearse and carriage, and had gone through all the solemnity of a regular funeral." " During the week immense quantities of the wild pigeon [Passenger Pigeon, *Columba migratoria*] had been flying over the city, in their way to and from a *roost* in the neighborhood. These birds had been slaughtered by myriads, and were for sale by the bushel at the corners of every street in the city. Although all the birds which could be killed by man made the smallest impression on the vast multitude contained in one of these flocks,— computed by Wilson to consist sometimes of more than twenty-two hundred millions,— yet to Booth the destruction seemed wasteful, wanton, and, from his point of view, was a willful and barbarous murder."

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[1] Auk, Vol. XXVII, October, 1910, pp. 428–443.

[2] Clarke, James Freeman. Memorial and Biographical Sketches. Boston, 1878, pp. 263–276.

The other incident happened August 14, 1826, while McKenney was crossing Lake Superior in a storm. He describes it as follows:[1] "At six o'clock, and when about three-fourths of the way across, the lake growing white with foam, and the steersman calling for help to keep the canoe from being blown round side to the sea, which is generally afforded by two or three of the voyageurs striking their paddles down by the side of the canoe, and the bowsman working his the contrary way, a bird was seen coming across the lake, feeble in its efforts, and directing its course towards our canoes. It passed Mr. Holliday's, and on getting in a line with mine, turned and followed it. It appeared to make one last effort, and with its feet foremost, lit on the end of the upper yard, when instantly one of the voyageurs raised his paddle saying, 'mangé-mangé,' and in the act of giving the bird the meditated stroke, I caught his arm, and prevented it. I then ordered the steersman to untie the rope, which, passing through the top of the mast, was tied near him, when the sail was lowered, and the bird taken and handed to me. It was too feeble to fly. Its heart beat as if it would break. I took some water from the lake with my hand, into my mouth, put the bill of the little wanderer there, and it drank as much as would have filled a table spoon — then breaking up some crackers, I fed it. My next difficulty was to fall upon some plan for taking it home. It seemed to have sought my protection, and nothing shall cause me to abandon it. On looking around me, the mocock that the Indian woman gave me struck my sight. It was the only thing in the canoe in which it was possible to put it. So I have given it a lodgment in that. It is a wild pigeon, nearly full grown, and is perhaps the only survivor of a flock from Canada. Thousands of them perish in crossing every season, and I am told they are often seen on the lake shore fastened together by their feet, looking like ropes of onions. The lake, in the direction in which this one came, must be at least sixty miles across.

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[1] McKenney, Thomas L. Sketches of a Tour to the Lakes, etc. Baltimore, 1827, pp. 352, 353.

"This is a member of the dove family, and the 'travelled dove' of the voyage. Is it a messenger of peace? — Why did it pass one canoe, and turn and follow another? — Why come to me? — None of these questions can be answered. But of one thing this poor pigeon is sure — and that is, of my *protection*; and though only a pigeon, it came to me in distress, and if it be its pleasure, we will never part." In a footnote the writer adds: "This pigeon, called by the Chippeways *Me-me*, and by which name, it is called, is yet with its preserver — tame, and in all respects domesticated. It knows its name, and will come when called."

This collection of records is classified according to regions, and the notes are arranged chronologically under each.

Canada.

The first country to be considered is naturally Canada, the former home of the breeding pigeon. The account begins with 'The First Relation of Jaques Carthier of S. Malo, 1534' in which[1] "stockdoves" are recorded at Cape Kildare. In 1535–36, on the second voyage up the St. Lawrence, he finds: "There are also many sorts of birds, as....Turtles, wilde Pigeons,...." In the same region, in 1542, John Alphonse of Xanctoigne, chief pilot to Roberval, notes[2] "Fowle .... in abundance, as .... turtle doves, ..."

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[1] Original Narratives of Early American History. Early English and French Voyages. New York, 1906, pp. 17, 71.

[2] Hakluyt, Richard. The Principal Navigations Voyages Traffiques and Discoveries of the English Nation. Glasgow, 1903–5. Extra Series, Hakluyt Society, Vol. VIII, p. 282.

About forty years later (1583), Sir George Peckham in his report of the discoveries of Sir Humfrey Gilbert in Newfound Lands, mentions[1] "Stocke dooves" as one "Of [the] Birds." In a narrative of the same expedition, Captain Edward Haies records[2] "rough footed like doves, which our men after one flight did kill with cudgels, they were so fat and unable to flie." In 1607 Marke Lescarbot, in speaking of Ile Saint Croix, not far from Port Royal, says:[3] "We made there also good Pasties of Turtle Doves, which are very plentifull in the Woods, but the grasse is there so high that one could not find them when they were killed and fallen in the ground." In the 'Third Voyage of Sieur de Champlain, in the year 1611,' at the Falls of St. Louis:[4] "Once on St. Barnabas's day, Sieur du Parc, having gone hunting with two others, killed nine [stags]. They had also a very large number of pigeons." In 1623[5] "Pigeon" is mentioned as one of the many sorts of birds all along the Nova Scotian coast. The last note of this century is by Sagard Theodat who says,[6] "There are....an infinite number of Turtle-doves, which they call Orittey, which feed in part on acorns which they readily go at whole, and in part on other things."

Towards the close of the eighteenth century, we have three notes, the first of which comes in 1770 when Wynne says that the[7] "Canadians have variety of game,....vast flights of wild pigeons, ..." The second record is one made by Madame De Riedesel, who writes as follows:[8] "On passing a wood, I was suddenly roused from my reveries, by something that seemed like a cloud before our carriage, until I discovered that it was a flight of wild pigeons, of which there are such an abundance in Canada, that they are for many weeks the exclusive food of the inhabitants, who shoot them with fowling-pieces, loaded with the smallest shot. Upon perceiving a flock, the Canadian hunter shouts, which makes the pigeons start all at once, so that by shooting at random, sometimes two or three hundred are wounded, and afterwards knocked down with sticks. The hunters sell a part, and keep the remainder for their own use; and these birds furnish soups and fricassees, which are usually dressed with a cream sauce and small onions [chives]. During the shooting season, pigeons are on every table." (June 16, 1777.) The third and last note[1] is a mere notice of a pigeon which flew by Mackenzie when in the Slave Lake region.

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[1] *Ibid.*, p. 115.

[2] Prince Society Publications, Vol. XXXI, p. 136.

[3] Purchas, Samuel. Hakluytus Posthumus or Purchas His Pilgrimes. Glasgow, 1905–7. Hakluyt Society, Extra Series, Vol. XVIII, p. 282.

[4] Prince Soc. Publ., Vol. XIII, pp. 85, 86.

[5] Purchas, Samuel, *Ibid.*, Vol. XIX, p. 399.

[6] Sagard Theodat, G. Le Grand Voyage du Pays des Hurons, 1632, Second Partie. Chapter I, p. 303.

[7] Wynne, J. H. A General History of the British Empire in America: 2 vols., London, 1770, Vol. II, p. 208.

[8] De Riedesel, Madame. Letters and Memoirs Relating to the War of American Independence, etc. (orig. edit., 1800). Translated by M. de Wallenstein, New York, 1827, pp. 126, 127.

In the nineteenth century the record begins the very first year, 1800, when Harmon the North West fur trader mentions[2] the pigeons in two or three instances. On May 9, 1800, while at Au Chat he observes: "We arrived this morning, at this place, where the North West Company have a small establishment; and I have passed the afternoon, in shooting pigeons." August 2, 1800, the Mouth of the River Winipick: "The after part of the day, I spent in shooting pigeons, which I found to be numerous, as at this season, red raspberries, and other kinds of fruit, are ripe, and exist here in abundance." In the following year, May 2, at Montagne Aiseau (or Bird Mountain) he says, "Of fowls, we have....pigeons ...." Six years later, in 1807, George Heriot describes the species as follows:[3] "The wood-pigeons are so multitudinous, that at certain seasons they obscure the atmosphere in parts of the country which are not much settled, and are frequently knocked down in great numbers, by means of long poles. Their flight is so rapid, that when two columns, moving in opposite directions at the same height in the atmosphere, encounter each other, many of them fall to the ground, stunned by the rude shock communicated by this sudden collision. Shot, if fired as they approach, will seldom make any impression on them; the only certain method of bringing them to the ground is by firing immediately after they pass. A considerable of the produce of the cultivated lands was some years ago devoured by these birds, and wherever they rested, they appeared to cover, like leaves, a great part of the trees of the forest."

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[1] Mackenzie, Alexander. Voyages from Montreal on the River St. Laurence, through the Continent of North America, to the Frozen and Pacific Oceans in the Years 1789 and 1793. London, 1801, p. 81.

[2] Harmon, Daniel Williams. A Journal of Voyages and Travels in the Interior of North America, between the 47th and 58th Degrees of N. Latitude, extending from Montreal to the Pacific, etc. New York, edit. 1903, pp. 4, 22, 63.

[3] Heriot, George. Travels through the Canadas, etc. London, 1807, pp. 517, 518.

From 1800 to 1810 Alexander Henry made several notes on the pigeon, particularly in western Canada. When near Winnepeg August 19, 1800:[1] "Pigeons were in great numbers; the trees were every moment covered with them, and the continual firing of our people did not appear to diminish their numbers." On April 22, 1801, he saw "Pigeons flying N. in great numbers." Shortly after, May 19, at Rat River, he killed a pigeon. At Pembina River Post, May 4, 1804, were "Extraordinary numbers of wild pigeons; I never before saw so many." When he approached Isle de la Traverse, August 21, 1808, "Pigeons were plentiful on our arrival, but they instantly left." Two days later, at Pine Island, he says, "We shot....some pigeons, of which we saw great numbers." Lastly, August 31, 1810, at New White Earth House, he finds "Pigeons are passing N. to S. in immense flocks, particularly in the morning and evening."

About the same time Hugh Gray, in a letter from Quebec, writes:[2] "During the summer the woods of Canada abound with birds of a great variety of sorts and sizes,..... Some of these pass the whole summer in Canada; others, such as the pigeons, are only found at certain seasons, as they pass from the southern to the more northerly parts of the American continent and vice versa."

In 1820, Sansom, in Lower Canada, also found these[3] "wild-pigeons, in inconceivable abundance." In 1832 Joseph Bouchette, in his 'The British Dominions in North America,' etc.. 2 vols., London, 1832 (Vol. II, p. 145), found that pigeons furnished objects for the sportsman in New Brunswick, as did Godley when at Kingston (August); he says, that the pigeons are[4] "important objects of an American chasse."

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[1] Henry, Alexander, and Thompson, David. The Manuscript Journals of, 1799–1814. Edited by Elliott Coues. 3 vols., New York, 1897. Vol. I, pp. 46, 176, 183, 243; Vol. II, 467, 469, 622.

[2] Gray, Hugh. Letters from Canada, written during a residence there in the Years 1806, 1807, and 1808; etc. London, 1809, pp. 245, 246.

[3] Sansom, Joseph. Travels in Lower Canada, etc. London, 1820, p. 49.

[4] Godley, John Robert. Letters from America. 2 vols., London, 1844. Vol. I, p. 126.

In 1848 (July 27) Paul Kane, when in the Winnipeg region,[1] "found immense flocks of wild pigeons, and killed a good supply." Ten years later, in the same region, Henry Y. Hind noted [2] (June 10, 1858): "In a wheat field opposite St. James' Church were several pigeon traps, constructed of nets 20 feet long by 15 broad, stretched upon a frame; one side was propped up by a pole 8 feet long, so that when the birds passed under the net to pick up the grain strewed beneath, a man or boy concealed by the fence withdrew the prop by a string attached to it, and the falling net sometimes succeeded in entrapping a score or more of pigeons at one fall. Near the net some dead trees are placed for the pigeons to perch on, and sometimes stuffed birds are used as decoys to attract passing flocks." In three other instances the expedition found these birds. When west of Blue Hills, June 30, 1858, "Vast numbers of pigeons were flying in a north-westerly direction,...." At Qu'Appelle River, July, 1858, "pigeons were calmly and listlessly perched on the dense trees, having eaten plentifully of their favorite fruits"; and finally, between the South and Main branches of the Saskatchewan, they recorded the pigeon August 5, 1858.

In his 'Maple Leaves,' etc. (Quebec, 1863-5), J. M. LeMoine says (p. 96): "Wild pigeon shooting, especially in western Canada, yields an abundant harvest. The passenger pigeon still resorts to the Niagara district in such quantities that Audubon's graphic description of the flights of wild pigeons in Kentucky ceases to appear overdrawn. Until 1854, there existed in the woods back of Chateauguay, at a place called the Five Points, a pigeon roost; the devastation caused by this countless host in the wheat fields became very great, but in presence of the incessant attacks of man, a general pigeon stampede took place — the roost is now deserted."

In 1869 Wm. Canniff writes of this species as follows:[3] "Sheriff Sherwood, ... remarks: 'I recollect seeing pigeons flying in such numbers that they almost darkened the sky, and so low often as to be knocked down with poles; I saw, where a near neighbor killed thirty at one shot, I almost saw the shot, and saw the pigeons after they were shot.'" This same year Coffin, when in the Red River country, says that one day,[1] "While pitching our tents, a flock of pigeons flew past, and down in the woods along the bank of the river we could hear their cooing. Those who had shot-guns went to the hunt."

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[1] Kane, Paul. Wanderings of an Artist among the Indians of North America from Canada to Vancouver's Island and Oregon, etc. London, 1859, p. 438.

[2] Hind, Henry Y. Northwest Territory. Report on the Assiniboine and Saskatchewan Exploring Expedition. Toronto, 1859, pp. 39, 40, 43, 61, 65.

[3] Canniff, Wm. History of the Settlement of Upper Canada (Ontario, etc.). Toronto, 1869, p. 201.

The last notice of the pigeon to be given is an extended account by Geikie, who writes:[2] "The flocks of pigeons that come in the early spring are wonderful. They fly together in bodies of many thousands, perching, as close as they can settle, on the trees when they alight, or covering the ground over large spaces when feeding. The first tidings of their approach is the signal for every available gun to be brought into requisition, at once to procure a supply of fresh food, and to protect the crops on the fields, which the pigeons would utterly destroy if they were allowed. It is singular how little sense, or perhaps fear, such usually timid birds have when collected together in numbers. I have heard of one man who was out shooting them, and had crept close to one flock, when their leaders took a fancy to fly directly over him, almost close to the ground, to his no small terror. Thousands brushed past him so close as to make him alarmed for his eyes; and the stream still kept pouring on after he had discharged his barrels, right and left, into it, until nothing remained but to throw himself on his face till the whole had flown over him. They do not, however, come to any part of Canada with which I am acquainted in such amazing numbers as are said by Wilson and Audubon to visit the western United States.

"A curious fact respecting them is that they have fixed roosting-places, from which no disturbance appears able to drive them, and to these they resort night by night, however far they may have to fly to obtain food on the returning day ....

"I myself have killed thirteen at a shot, fired at a venture into a flock; and my sister Margaret killed two one day by simply throwing up a stick she had in her hand as they swept past at a point where we had told her to stand, in order to frighten them into the open ground, that we might have a better chance of shooting them. I have seen bagfuls of them that had been killed by no more formidable weapons than poles swung right and left at them as they flew close past. The rate at which they fly is wonderful, and has been computed at about a mile a minute, at which rate they keep on for hours together, darting forward with rapid beats of their wings very much as our ordinary pigeons do."

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[1] Coffin, Charles Carleton. The Seat of Empire. Boston, 1870, p. 59.

[2] Geikie, John C. Adventures in Canada; or Life in the Woods. Philadelphia, pp. 212-216.

New England.

In New England, Champlain seems to be the first (July 12, 1604) to record the Wild Pigeon. Of an Island Harbor in latitude 43° 25′ near Cape Porpoise, he says:[1] "There are in these islands so many red currants that one sees for the most part nothing else, and an infinite number of pigeons, of which we took a great quantity." The year following, 1605, James Rosier wrote[2] 'A True Relation of the Voyage of Captaine George Waymouth' where, in his "A Briefe Note of what Profits we saw the Country yeeld in the small time of our stay there," he enumerates "Turtle-doves."

In 1622, Captain John Smith reports,[3] "*great flocks of Turkies, ... Pigeons,*" etc. The same year, we have another note which says:[4] "The country aboundeth with diversity of wild fowl, as .... many doves, especially when strawberries are ripe." A few years later, March 12, 1631, Gov. Dudley, in a "Letter to the Countess of Lincoln," thinks of the vast flights as omens. He writes as follows:[5] "Upon the eighth of *March*, from after it was fair day light, until about eight of the clock in the forenoon, there flew over all the towns in our plantations, so many flocks of doves, each flock containing many thousands, and some so many, that they obscured the light, that it passeth credit, if but the truth should be written; and the thing was the more strange, because I scarce remember to have seen ten doves since I came into the country: they were all turtles, as appeared by divers of them we killed flying, somewhat bigger than those of *Europe*, and they flew from the north-east, to the south-west; but what it portends, I know not."

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[1] Champlain, Sieur de, Voyages of. Voyage in the year 1604. The Publications of the Prince Society, Vol. XII, 1878, Boston, pp. 68, 69.

[2] Original Narratives of Early American History, Vol. II, New York, 1906, p. 393.

[3] Smith, Capt. John, Works of, 1608–1631. Edited by Edward Arber. New England Trials, London, 2nd edition, p. 261.

[4] A Brief Relation of the Discovery and Plantation of New England. London, 1622. Mass. Hist. Soc. Coll., Second Series, IX, 1822, p. 18.

[5] Mass. Hist. Soc. Coll., VIII, 1802, p. 45.

In 1634 we find the first extended notice of the pigeons of New England. Wood describes them at some length:[1] "The Pigeon of that Countrey, is something different from our Dove-house Pigeons in *England*, being more like Turtles, of the same colour; but they have long tayles like a Magpie: And they seeme not so bigge, because they carry not so many feathers on their backes as our *English* Doves, yet are they as bigge in body. These Birds come into the Countrey, to goe to North parts in the beginning of our Spring, at which time (if I may be counted worthy, to be believed in a thing that is not so strange as true) I have seene them fly as if the Ayerie regiment had beene Pigeons; seeing neyther beginning nor ending, length, or breadth of these Millions of Millions. The shouting of people, the ratling of Gunnes, and pelting of small shotte could not drive them out of their course, but so they continued for foure or five houres together: yet it must not be concluded, that it is thus often; for it is but at the beginning of the Spring, and at *Michaelmas*, when they returne backe to the Southward; yet are there some all the yeare long, which are easily attayned by such as looke after them. Many of them build amongst the Pine-trees, thirty miles to the North-east of our plantations; joyning nest to nest, and tree to tree by their nests, so that the Sunne never sees the ground in that place, from whence the *Indians* fetch whole loades of them."

In the well known 'New English Canaan' (Amsterdam, 1637), by Thomas Morton, he in his general survey of the country says it [2] "Contained....Millions of Turtledoves one the greene boughes, which sate pecking of the full ripe pleasant grapes that were supported by the lusty trees, whose fruitfull loade did cause the armes to bend." Six years later (1643), Roger Williams's 'Key into the Language of America' appeared in London.[3] Of the "Wuskowhannanaûkit; Pigeon Countrie" he writes: "In that place these fowle breed abundantly, and by reason of their delicate food, especially in Strawberrie time, when they pick up whole large Fields of the old grounds of the Natives, they are a delicate fowle, and because of their abundance, and the facility of killing them, they are and may be plentifully fed on."

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[1] Wood, William. New Englands Prospect. London, 1634. Prince Society Publications, Vol. I, 1865, p. 31, 32.

[2] Prince Soc. Publications, Vol. XIV, p. 180.

[3] Colls. R. I. Hist. Soc., Vol. I, p. 87; also Mass. Hist. Soc. Coll., First Series, Vol. III, p. 220.

In the early history of the Plymouth Colony, the pigeons became at times a menace, as Winthrop shows. Of the years 1643 and 1648 he particularly speaks.[1] "The immediate causes of this scarcity [of corn] were the cold and wet summer, especially in the time of the first harvest [in 1643]; also, the pigeons came in such flocks (above 10,000 in one flock), that beat down, and eat up a very great quantity of all sorts of English grain:...."

"This month [August, 1648], when our first harvest was near had in, the pigeons came again all over the country, but did no harm, (harvest being just in) but proved a great blessing, it being incredible what multitudes of them were killed daily. It was ordinary for one man to kill eight or ten dozen in half a day, yea five or six dozen at one shoot, and some seven or eight. Thus the Lord showed us, that he could make the same creature, which formerly had been a great chastisement, now to become a great blessing."

Barber, much later (1841), practically repeats the same as follows:[2] "The very wet weather of 1642 produced a dearth of corn in Boston in the spring of 1643, myriads of pigeons appeared the same season and did much injury. It is an old observation in America, that pigeons are uncommonly numerous in the spring of sickly years."

In 1648 we have our first metrical observation where the author begins of summer as follows:[3]

"Bespread with Roses Sommer 'gins take place with hasty speed,
Whose parching heate Strawberries coole doth moderation breed.
Ayre darkening sholes of pigeons picke their berries sweet and good."

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[1] Winthrop, John. The History of New England from 1630 to 1649. Edited by James Savage. 2 vols., Boston, 1825, 1826. Vol. II, pp. 94, 331, 332.

[2] Barber, J. W. The History and Antiquities of New England, New York and New Jersey, etc. Worcester, 1841, p. 474.

[3] Good News from New-England: etc. London, 1648. Mass. Hist. Soc. Coll., Fourth Series, Vol. I, 1852, p. 202.

The final note in the seventeeth century comes in 1680 when Hubbard says [1] that the "pigeons, (that come in multitudes every summer, almost like the quayles that fell round the campe of Israel in the wilderness,)....by nature's instinct, or by conduct of Divine Providence, have found the way into these endes of the earth,...."

In the eighteenth century the first record is December 11, 1707, when Samuel Sewall, in his Diary (1674–1729), observes that [2] "Yesterday I was told of a vast number of Pigeons in the Woods this Moneth. Capt. Mills at his Sister's Wedding says he saw an incredible Number at Woodstock last Friday."

A considerable period intervenes before we come to the records of Revs. Smith and Deane who, at Portland, Me., kept Diaries from 1722–1787. Their entries follow: [3]

> "1733. *August* Pigeons very plenty. We kill more than we can eat."
>
> "1744, August 20. I don't remember that pigeons were ever so plenty as now."
>
> "1744 August 28 Gunning after pidgeons, which increase in plenty. I brought home ten dozen in my chaise."
>
> "1752 Sept. 2. I rode with....to Marblehead (Windham) a pigeoning; we got near ten dozen."
>
> "1759 Sept. 1. Abundance of pigeons."

In 1741 Oldmixon in his 'The British Empire in America,' etc. (2nd edition, Vol. I, London, 1741, p. 186) merely states that "Vast Flights of Pigeons come and go at certain Seasons of the Year." But he is followed in 1755 by Douglass who gives a more detailed account.[4] "The common food is mostly already mentioned, to these we may add....wild (g) pigeons,...." In the footnote (g) he adds: "*Palumbus migratorius* Catesby, *Palumbus torquatus* Aldrovand. The wild pigeon, pigeon of passage, or ring dove. These are plenty at certain seasons, all over America, and of great benefit in feeding the poor. The French call them *ramier,* the Dutch call them *ringle duif, wilde duif, boom duif.*"

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[1] Hubbard, William. General History of New England, 1680. Mass. Hist. Soc. Coll., Second Series, Vol. V, 1817, p. 25.

[2] Mass. Hist. Soc. Coll., Fifth Series, Vol. VI, p. 206.

[3] Smith, Rev. Thomas, and Deane, Rev. Samuel. Journals of the. By Wm. Willis, Portland, Me., 1849, pp. 266, 269, 114, 149, 273.

[4] Douglass, William. A Summary, Historical and Political, of the First Planting, Progressive Improvements, and Present State of the British Settlements in North-America. 2 vols., Boston, 1755. Vol. I, pp. 125, 126; Vol. II, pp. 217, 218.

"Wild pigeons, palumbus torquatus migratorius, see Vol. 1, p. 126, in their passage northward, begin to appear in New-England end of February and beginning of March, but not in large numbers, because they travel more inland for the benefit of last autumn berries of several sorts in the wilderness; they return in their passage southward, in larger quantities, end of August; and some years since have been sold at 4d. currency per dozen; they at that season keep towards the plantations for the benefit of their harvest. They are of great advantage in their seasons towards victualling our plantations; the country people feed some of them (they are catched alive in nets or snares) for sometime with Indian corn, and brought to market, and are good delicate eating; cuming seed or its oil, are found by experience the best lure to induce the pigeons to their nets. The spring flights 1751 were very large, like thunder shower clouds, but soon over."

In 1770, J. H. Wynne, in his 'General History of the British Empire in America' (2 vols., London: Vol. I, p. 41), says: "New England produces a great variety of fowls; such as .... pigeons ...." Among the feathered tribe of Connecticut Peters, in 1782, notes[1] "innumerable flocks of pigeons, which fly south in autumn;"

In 'The History of New Hampshire' (Boston, 1792), the famous historian Jeremy Belknap (Vol. III, pp. 171, 172) speaks of the "Wild Pigeon, *Columba migratoria.*" "Wild pigeons come in the spring, from the southward, in great flocks, and breed in our woods, during the summer months. They choose the thickest parts of the forest, for the situation of their nests .... In the journal of *Richard Hazzen,* who surveyed the Province line, in 1741, there is this remark; 'for three miles together, the pigeons nests were so thick, that five hundred might have been told on the beech trees at one time; and could they have been counted on the hemlocks, as well, I doubt not but five thousand, at one turn around.' This was on the western side of the Connecticut river, and eastward of

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[1] Peters, Rev. Samuel. A General History of Connecticut. 2nd edition, London, 1782, p. 255.

Deerfield river. Since the clearing of the woods, the number of pigeons is diminished."

Shortly afterwards (1794) Williams gives a very good statement of this species. He begins thus:[1]

"Wild Pigeon, *Columba migratoria* Time of appearance, March 20. Departure, Oct. 10.

"In the Wild Pigeon, the multiplying power of nature acts with great force and vigour. The male and female always pair: They sit alternately upon the eggs, and generally hatch but two at a time; but this is repeated several times in a season. The accounts which are given of the number of pigeons in the uncultivated parts of the country, will appear almost incredible to those who have never seen their nests. The surveyor, *Richard Hazen*, ... [then follows Hazen's account]. The remarks of the first settlers of Vermont, fully confirm this account [Hazen's]. The following relation was given me, by one of the earliest settlers at Clarendon: 'The number of pigeons was immense. Twenty five nests were frequently to be found on one beech tree. The earth was covered with these trees, and with hemlocks, thus loaded with the nests of pigeons. For an hundred acres together, the ground was covered with their dung, to the depth of two inches. Their noise in the evening was extremely troublesome, and so great that the traveller could not get any sleep, where their nests were thick. About an hour after sunrise, they rose in such numbers as to darken the air. When the young pigeons were grown to a considerable bigness, before they could readily fly, it was common for the settlers to cut down the trees, and gather a horse load in a few minutes.' The settlement of the country has since set bounds to this luxuriancy of animal life; diminished the number of these birds; and drove them further to the northward."

In the course of a missionary tour in Maine Rev. Paul Coffin (1796) twice dined on pigeons,— August 13 at Duck trap, Me., and again August 16, at Crawford Pond. The same day at Union, Me.,[2] "[his host] took yesterday morning twenty-four dozen pigeons in a net at once; and this morning seventeen dozen ....

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[1] Williams, Samuel. The Natural and Civil History of Vermont. Walpole, N. H., pp. 112-114.

[2] Me. Hist. Soc. Coll., First Series, Vol. IV, pp. 325, 328, 362.

Thirty-two dozen pigeons were taken at Sunnebeck [Pond, Barrettstown] at one spring of the net." In 1798, August 30, at Livermore, Me., "[his host] had just sprung his net on six dozen pigeons and took them all. To take a whole flock is a common thing with him."

In 1804 "pigeons" were mentioned as among the feathered kind in the Stockbridge Indian Country.[1] In 1815, in Carver, Mass.,[2] "Wood pigeons .... are Common," as were they in Rochester, Mass., the same year. In the latter place, the writer says,[3] "Wild pigeons annually seek these woods and are very common in this town in August." In a footnote he adds: "Some of the peculiarities of this bird, it is said, are to visit marshes for mud, very early in the morning. They fly, it is computed, at the rate of a mile a minute, leaving the sea coast, by 8 or 9 o'clock A. M. going with this rapidity, occasionally resting in intervening forests far into the interior of the country. This habit is well known about Medford, where they are caught on the marshes by live pigeon decoys."

In the first volume of Timothy Dwight's 'Travels,' etc. (New Haven, 1821, 1822, p. 55), it is said: "Pigeons are (considered amongst) the Land birds principally coveted at the tables of luxury." Shortly after (1824) Zadock Thompson, so well known to zoölogists, barely mentions (p. 18) the "pigeon" as a "bird of passage" in his 'A Gazetteer of the State of Vermont,' but in 1842 he gives it more attention:[4] "The American Wild Pigeon is met with in greater or less numbers throughout the whole region from Mexico to Hudson's Bay. These birds are remarkably gregarious in their habits, almost always flying, roosting and breeding in large flocks. When the country was new there were many of their roosts and breeding places in this state." (Then follow Hazen's and Williams's accounts.)

Finally, in 1846, Beckley gives us the following:[5] "In the early settlement of the state, *wild pigeons* were wonderfully plenty.

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[1] Mass. Hist. Soc. Coll., First Series, Vol. IX, p. 100.

[2] Mass. Hist. Soc. Coll., Second Series, Vol. IV, 1816, p. 275.

[3] Mass. Hist. Soc. Coll., Second Series, Vol. IV, 1816, p. 256.

[4] Thompson, Zadock. History of Vermont, Natural, Civil and Statistical. Burlington, Vt., 1842, Part I, p. 100.

[5] Beckley, Rev. Hosea. The History of Vermont. Brattleboro, 1846, pp. 304, 305.

So few are now found in the forests and on the mountains, that the account given by the first settlers of their numbers and multiplication seems almost incredible .... The progress of civilization and refinement; and the clearing of the hills and vallies have much lessened the number of these birds, or driven them to other regions."

New York.

In the seventeenth century the early writers quite frequently remarked the abundance of the pigeons in the New Netherlands, and we have in this century alone nine or ten such records. First of all comes Wassenaers's observation that[1] "Pigeons fly wild, they are chased by the foxes like fowls." In 1625 John de Laet says[2] that when Hudson was near the present city of Hudson "two men were also despatched at once with bows and arrows in quest of game, who soon after brought in a pair of pigeons which they had shot."

In his 'Voyages from Holland to America,' 1632–1644, DeVries mentions pigeons in three different instances. In one case he remarks,[3] "There are....pigeons which fly together in thousands, and our people sometimes shoot thirty, forty, and fifty of them at a shot." In another place he speaks of them as follows: "Pigeons, at the time of year when they migrate, are so numerous, that the light can hardly be discerned where they fly....I have also seen, at different times, thirty to thirty-four pigeons killed at one shot, but they are not larger than turtle-doves, and their bodies are exactly like those of the turtle-doves in Fatherland, except they have longer tails."

In 1644 Megalopensis practically reiterates the same observations.[4] "In the forests here there are also many....pigeons that fly in flocks of thousands, and sometimes 10, 20, 30, and even 40 and 50 are killed at one shot." In his second voyage into the upper country of the Iroquois (Onondaga mission) Radisson found[1] "The ringdoves in such a number that in a nett 15 or 1600 att once might be taken."

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[1] Wassenaers, Historie Van Europa. Amsterdam, 1621–1632. Documentary History of New York, Vol. III, Albany, 1850, p. 3.

[2] Laet, John de. The New World, or A Description of the West Indies. Leyden, 1625. N. Y. Hist. Soc. Coll., Vol. I, 1841, p. 300.

[3] DeVries, D. P. N. Y. Hist. Soc. Coll., New Series, Vol. III, 1857, pp. 58, 90, 110.

[4] Megalopensis, Johannes Junior. A Short Sketch of the Mohawk Indians in New Netherlands, 1644. N. Y. Hist. Soc. Coll., N. S., Vol. IV, 1857, p. 150.

In 'The Representation of New Netherlands,' etc., Adrian van der Donck enumerates[2] "multitudes of pigeons resembling coal-pigeons, but a little smaller," and in 'A Description of the New Netherlands' (2nd edit., Amsterdam, 1656), he speaks of this species at some length.[3] "The pigeons, which resemble coal pigeons, are astonishingly plenty. Those are most numerous in the spring and fall of the year, when they are seen in such numbers in flocks, that they resemble the clouds in the heavens, and obstruct the rays of the sun. Many of these birds are shot in the spring and fall, on the wing, and from the dry trees whereon they prefer to alight, and will sit in great numbers to see around them, spring and fall, on the wing, and from the dry trees whereon they prefer to alight, and will sit in great numbers to see around them, from which they are easily shot. Many are also shot on the ground, and it is not uncommon to kill twenty-five or more at a time. The Indians, when they find the breeding places of the pigeons, (at which they assemble in numberless thousands,) frequently remove to those places with their wives and children, to the number of two or three hundred in a company, where they live a month or more on the young pigeons, which they take, after pushing them from their nests with poles and sticks."

In 1670 Daniel Denton in 'A Brief Description of New York,' etc., says:[4] "Wild Fowl there is great store of, as Turkies,.... Pidgeons, and divers others," and in another note thinks of New York as a place "where besides the pleasure in Hunting, he may furnish his house with excellent fat Venison,....Pidgeons and the like." The following year Montanus remarks:[5] "The pigeons fly in such flocks that the Indians designedly remove to their breeding places where the young birds, pushed by hundreds from their nests, serve for food during a long month for the whole family."

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[1] Radisson, Peter Esprit. Voyages of, etc., 1652–1684. Prince Soc. Publications, Vol. XVI, 1885, p. 118.

[2] N. Y. Hist. Soc. Coll., N. S., Vol. II, 1849, p. 265.

[3] N. Y. Hist. Soc. Coll., N. S., Vol. I, 1841, p. 173.

[4] Bull. Hist. Soc. Penn., Vol. 1, 1845–47, pp. 6, 15.

[5] Montanus. Description of New Netherlands. Amsterdam, 1671. Doc. Hist. New York (octavo ed.), Vol. IV, 1851, pp. 118, 123.

In 'New York in 1692, [a] Letter from Chas. Lodwick.... Dated May 20, 1692,' says [1] "wild pidgeons are here in aboundance; they breed up ye country some hundreds of miles of from us Northward, and come flying in great quantity in ye Spring, and pass to ye Southward, and return to us about ye time our corn is ripe, and settle in ye Trees, and on ye corn Lands in great numbers." In 1699, we close the century with Viele's observation made at Onondaga. On April 30, he says,[2] "We sent for the Sachims of Cayouge....; Not far from Cayouge the Messenger met a Cayouge Indian who told him that all their Indians young and old, were in the woods to fetch young pidgeons."

In June, 1749, Peter Kalm when travelling above Albany,[3] "saw immense numbers of those wild pigeons flying in the woods, which sometimes come in incredible flocks to the southern *English* colonies, most of the inhabitants not knowing where they come from. They have their nests in the trees here; and almost all the night make a great noise and cooing in the trees, where they roost. The *Frenchmen* shot a great number of them, and gave us some, in which we found a great quantity of the seeds of the elm, which evidently demonstrated the care of Providence in supplying them with food; for in *May* the seeds of the red maple, which abounds here, are ripe, and drop from the trees, and are eaten by the pigeons during that time; afterwards, the seeds of the elm ripen, which then become their food, till the other seeds ripen for them. Their flesh is the most palatable of any bird's flesh I ever tasted.

"Almost every night we heard some trees crack and fall, whilst we lay here in the wood, though the air is so calm that not a leaf stirred. The reason of this breaking I am totally unacquainted with.... It may be, that the above-mentioned wild pigeons settle in such quantities on one tree as to weigh it down."

In a 'Journey to Oghquaga' (Broome Co.), Rev. Gideon Hawley, 1753, remarks:[4] "It may not be impertinent to observe, that in this wilderness, we neither hear nor see any birds of musick....

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[1] N. Y. Hist. Soc. Coll., N. S., Vol. II. 1849. p. 246.

[2] Journal of Arnout Cornelisse Viele's Negotiations at Onondaga. Documents Relating to the Colonial History of New York. Vol. IV. pp. 561. 563.

[3] Travels into North America. etc. Transl. by John R. Forster. Vol. II. 1771, pp. 311. 312.

[4] Doc. Hist. N. Y., Vol. III. 1850. p. 1042 (8vo edit.), or Mass. Hist. Soc. Coll., Vol. IV. 1795. pp. 61. 62.

There is *one wood* bird, not often seen, but heard without any melody in his note, in every part of the wilderness, wherever I have been. In some parts of this extensive country the wild pigeons breed in numbers almost infinite. I once passed an extensive valley where they had nested; and for six or eight miles, where the trees were near and thick, every tree had a number of nests upon it; and some, not less than fifteen or twenty upon them: But as soon as their young are able, they take wing and are seen there no more." In 'A Journal of the New Hampshire Scout,'[1] Sir Wm. Johnson's trip from Lake George to Crown Point, states that September 18, 1755, "Their People (French and Indians), some few [who] were at work at the Intrenchments seemed unconcerned — hunting Pidgeons etc. all around in the Wood."

In 1777 (June 23), when at camp at River Bouquet near Lake Champlain, Anbury says:[2] "There are at this season of the year prodigious flights of pigeons crossing the lake, of a most beautiful plumage, and in astonishing quantities. These are most excellent eating, and that you may form some idea as to their number, at one of our encampments, the men for one day wholly subsisted on them; fatigued with their flight in crossing the lake, they alight upon the first branch they can reach to, many are so weary as to drop in the water, and are easily caught; those that alight upon a bough being unable to fly again, the soldiers knock down with long poles.

"During the flights of these pigeons, which cross this lake into Canada, and are continually flying about in large flocks, the Canadians find great amusement in shooting them, which they do after a very singular manner: in the daytime they go into the woods, and make ladders by the side of the tall pines, which the pigeons roost on, and when it is dark, they creep softly under and fire up this ladder, killing them in great abundance; they then strike a light, and firing a knot of the pitch pine, pick up those they have killed, and the wounded ones that are unable to fly. During the flights of these pigeons, which generally last three weeks or a month, the lower sort of Canadians mostly subsist on them."

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[1] Doc. Hist. of New York, Vol. IV, 1851, p. 259. (8vo edit.)

[2] Anbury Thomas. Travels through the Interior Parts of America, in a Series of Letters. 2 vols., London, Vol. I, 1789, pp. 275, 276.

In 1788, George Henry Loskiel gives an interesting account of this species (equally applicable to Pennsylvania).[1] "The *Wild Pigeon* (columba migratoria) is of an ash grey color. The cock is distinguished by a red breast. In spring they take their passage to the north, and in autumn return to the south. In some years they flock together in such numbers, that the air is darkened by their flight. Wherever they alight, they make as much havock among the trees and garden-fruits as the locusts. The noise they make is so intolerable, that it is difficult for people near them to hear, or understand each other. In the year 1778 they appeared in such great numbers, that the ground under their resting-places was covered with their dung above a foot high, during one night. The Indians went out, killed them with sticks, and came home loaded. They delight in shooting these wild pigeons, and sometimes kill thirty at a shot. At night, a party of Indians frequently sally out with torches made of straw or wood, and when they get among the birds, light them. The pigeons being dazzled by the sudden glare, are easily knocked off the branches with sticks. Such a party once brought home above eighteen hundred of these birds, which they killed in one night in this manner. Their flesh has a good taste, and is eaten by the Indians either fresh, smoked, or dried. When the Iroquois perceive that the young pigeons are nearly fledged, they cut down the trees with the nests, and sometimes get two hundred young from one tree." Of one of its foods he says: "*Virginian Poke* (phytolacca decandra) is. . . .called by some pigeon-berry, the pigeons being extremely fond of them."

In 1803, Rev. Clark Brown, in a topographical description of Catskill, says:[2] "These and the wild pigeons are the chief fowls, which are killed for use." The next year (1804) Robert Munro, in his 'Description of Genesee Country,' states:[3] "Large numbers of pigeons frequent the country in spring and fall, of which a great many are caught in nets and shooting, and beds are sometimes made of their feathers."

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[1] Loskiel, George Henry. History of the Mission of the United Brethren among the Indians in North America. In three parts. Transl. by C. I. La Trobe. London, 1794, pp. 92, 93, 116 (orig. edit. 1788).

[2] Mass. Hist. Soc. Coll., Vol. IX, 1804, p. 118.

[3] Doc. Hist. of New York, Vol. II, 1849, p. 1175. (8vo edit.)

On March 25, 1830, at Albany,[1] "Pigeons had begun their migration, and thousands of them were overwhelmed in the storm; and they were taken in great abundance in the valley of the Buttermilk creek."

(To be concluded.)

GENERAL NOTES.

A Case of the Migration and Return of the European Teal in Massachusetts.— The following facts must be taken only for what they are worth, for unfortunately the data are incomplete. There is, however, no doubt in my mind that we are dealing with a case of the migration, and return to the place of birth, of a non-indigenous bird.

In the spring of 1909, Mr. Thomas Johnston came over from England to enter my employment, and brought with him five pairs of live European Teal (*Nettion crecca*), together with some other water-fowl. These birds were bred in England on the estate of Sir Richard Graham in Cumberland County, where many interesting experiments in propagating water-fowl are in progress.

The teal suffered many vicissitudes of fortune, from various causes, and were reduced in 1910 to two pairs. These two pairs were kept with other water-fowl in a small, enclosed, artificial pond, in the orchard at Wenham, situated about 75 yards from the farm-house, 40 yards from the road, and a third of a mile from Wenham Lake. No other varieties of teal were kept.

About the middle of June, 1910, two downy young were led out into the pond by one of the female teal. These thrived amazingly and obtained their wings so soon that the first attempt at their capture, which was put off for fear of disturbing other fowl, resulted in finding that the youngsters were too spry for the net. They turned out to be both females, and were not disturbed again. They traded between the pond and Wenham Lake all the summer and fall, spending the greater part of their time in the enclosed pond and feeding on a mud flat on the eastern shore of the lake. They were perfectly tame while in the pond, and were only flushed with difficulty, but outside its boundaries they were as wild as any teal.

On December 6, the pond, and also the lake, froze. The other fowl were placed in winter quarters the day before the freeze, and our teal vanished, as we thought for good.

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[1] Munsell, Joel. The Annals of Albany. Albany, 1858, Vol. IX, p. 206.

On the morning of April 19, 1911, a single female teal was found in the pond, none of the other fowl having yet been released from winter quarters. This teal was perfectly at home and absolutely tame. She allowed close approach, and when actually flushed made the same characteristic flight to the lake, keeping only a few yards off the ground. In a short time she returned. At the present date, May 17, she is still with us.

All that can be said is that this bird is a female green-winged teal, further identification being impossible as the plumage of the females of the American and European species is similar. I believe however that this returned bird is one of those that hatched in our pond, for the following reasons.

First, its actions are exactly similar to the birds of the previous summer, and very different from those which a strange teal would exhibit.

Second, it returned to a spot that no wild water-fowl have ever used.

Third, it shows no disposition to migrate north.

Fourth, the occurrence of Green-winged Teal in this locality in the spring is so rare that I have never met with one.

It seems also far more likely that our bird migrated to at least a much warmer latitude, for it could not possibly have wintered here, especially during such a severe winter as that of 1910–11. It returned nearly four weeks after the ice was out of the ponds and rivers.

Such cases, granted we are not mistaken, and also those where birds have successfully returned to their nests, when transported far beyond their natural range (see Watson, Carnegie Institute Publication No. 103, p. 227) force one to assume a directive sense in birds far beyond anything at present conceivable.— J. C. Phillips, *Wenham, Mass.*

Records of Butorides brunnescens in Cuba.— I beg to report the capture on January 19, 1911, of a specimen of *Ardea brunnescens* Gundl., in a small lagoon on the San Carlos Sugar Plantation at Guantanamo, Cuba. The specimen is an adult female in fine plumage and was the only heron about the lagoon at the time.

I believe this is the first record for eastern Cuba. Dr. Gundlach in his work on Cuban birds states having taken it once in western Cuba on the Siguagua Creek between Moron and Jucaro, when he found a family of them, but mentions no date. He also says that he heard of another specimen being taken near Havana which was sold to a taxidermist of that city. I am also informed that Prof. Bangs records having taken two specimens in the Isle of Pines, so mine is the fifth Cuban record for the species.— Charles T. Ramsden, *Guantanamo, Cuba.*

"Nuptial Plumes" of the American Bittern.— The writer read with peculiar interest the account by Mr. Brewster[1] of the "nuptial plumes" worn by certain bitterns, as he had himself witnessed the display described. On May 18, 1907, while with a class of students in bird study from the University of Chicago, an American Bittern was observed not seventy-five yards distant, in a marsh at Millers, Indiana. The white nuptial plumes were displayed in most conspicuous fashion so that the attention of all members of the party was directed to them at once.— R. M. STRONG, *University of Chicago, Chicago, Ill.*

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[1] Auk, XXVIII, 1911, pp. 90–100.

The Sandhill Crane (*Grus mexicana*) **in Ohio**.— The Carnegie Museum has recently acquired a fine specimen of the Sandhill Crane, shot on April 11, 1911, in the southwest corner of Huron County, near Plymouth, Ohio, by Mr. F. B. Lofland. It appears that Mr. Lofland first saw the bird a week or ten days previously and wounded it at that time, but did not succeed in capturing it. Upon the occasion of his next visit he again found the bird, which was unable to fly, and showed fight upon being approached, so that he was obliged to shoot it. The occurrence of this species in Ohio seems worthy of record, as it is certainly one of the rarest birds of the State, although Mr. Lofland thinks that he has seen other individuals at this same locality — an extensive swamp.— W. E. CLYDE TODD, *Carnegie Museum, Pittsburgh, Pa.*

A Woodcock in New York City.— On March 10, Mr. Louis H. Schortemeier brought into the office of the National Association of Audubon Societies a Woodcock, *Philohela minor*, which he had picked up in Maiden Lane, New York City, that morning (March 25, 1911). The bird appeared to be in good condition, save that it was probably weak from hunger. It was sent to the New York Zoölogical Park. Mr. Crandall informs me that the bird refused all food and was kept alive for about a week by stuffing it with worms and maggots, when it died. This has been the previous experience at the Park with these birds and is in line with one experience that I had. Although Mr. Crandall even secured earth worms for this bird, and buried them in soft earth, the bird refused to eat voluntarily.— B. S. BOWDISH, *Demarest, N. J.*

A Golden Plover in Massachusetts in April.— On April 8, 1911, while at Plum Island, Mass., with Dr. J. B. Brainerd, Barron Brainerd, and Richard M. Marble, I shot a Golden Plover (*Charadrius dominicus*). The bird proved to be a male with a single black feather near the center of his breast. He is now in my collection.

The bird had not been seen by members of the Plum Island life-saving station near which he was shot, neither were there any traces of old wounds. His body was entirely free from fat. Whether he was a straggling migrant or a bird which had been forced to winter is a question open to discussion.— JAMES L. PETERS, *Harvard, Mass.*

The Troupial at Santa Barbara, Cal.[1]— Yesterday (April 30, 1911)

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[1] Extracts from two letters written to the Editor, with permission to publish, dated respectively May 1 and May 4, 1911.— ED.

I think I made my best take in many a long day, in the shape of a magnificent male Troupial (*Icterus icterus*). The entire plumage is perfection, not a feather in tail or wings being frayed in the slightest, while the feet are in perfect shape. For these reasons I do not think it can possibly be a cage bird. It was in company with a large flock of Western Tanagers (*Piranga ludoviciana*) and Bullock's Orioles (*Icterus bullocki*) that were migrating through the upper part of Mission Cañon, one of the wildest localities near Santa Barbara. It was in good condition and seemed perfectly at home, the stomach being crammed with small green canker worms.

The plot in the Troupial situation is thickening. Yesterday (May 3) I remembered that a friend asked me some three weeks ago to tell him what some birds were that he described as being "about the size of a Meadowlark, but with a long black tail, black head, and a stripe around its back like a Holstein cow." I could not imagine what they could be and told him he must have been mistaken, although he is a good observer and has painted a number of birds very creditably. Yesterday, as I say, I remembered it and asked him to look over my birds and see if he could place it. He picked out the Troupial without hesitation, saying he would have known it anywhere by the stripe of yellow over the upper back, which, as he said, reminded him of a Holstein cow.

It would have been about the first week in April that he saw them, and three of them were together. This looks a good deal as if we had a small flight of *Icterus icterus* here at Santa Barbara this spring and, to my mind, quite eliminates the possibility of a cage bird theory.— J. H. Bowles, *Santa Barbara, Cal.*

The Western Evening Grosbeak in Denver, Colorado.— The undersigned has to report the occurrence of two individuals of this species (*Hesperiphona vespertina*) in Cheeseman Park, Denver, Colo., on April 12, 1911, one having been secured, which proved to be a male. Three others were seen in the same locality on April 20, 1911. This Park is on the eastern edge of the city, about two and one half miles from its center. Both these dates are comparatively late ones for this species so far from the higher mountain regions, though Thorne recorded it as having occurred at Fort Lyons, Colorado, on May 11, which is nearly one hundred miles eastward on the Plains.— W. H. Bergtold, *Denver, Colo.*

An Unusual Occurrence of the Pine Grosbeak in Rhode Island.— Visitations of the Pine Grosbeak (*Pinicola enucleator leucura*) into southern New England and the Middle Atlantic States have been probably more widespread during the past winter than at any other time since the severely cold season of 1903–04. In view of this fact the remarkably late northward flight of a flock of Grosbeaks observed at Providence, R. I., may be of special interest. Early in the morning of April 28, 1911, I saw fourteen Pine Grosbeaks on Neutaconkanut Hill, Providence. Several were sitting in a large oak tree over a swamp, and others on the bare, highest branches of saplings nearby. The birds allowed me to approach very near, and, while I looked on, four of them flew to the wet, springy ground below in order to drink. This was within thirty feet of where I stood. Six or seven of the members of the flock were males in the red plumage.

So far as records inform, April 28 is an unusual if not an unprecedented date for Pine Grosbeaks in this latitude. In southern New England they have generally been observed to linger no later than March; and April 10 is given as a normal date of last occurrence in Manitoba.— ROBERT CUSHMAN MURPHY, *Brown University, Providence, R. I.*

Orange-crowned Warbler at Youngstown, Ohio.— In 'The Auk' for April, 1911, p. 268, Richard C. Harlow, of State College, Pennsylvania, mentions the occurrence there of the Orange-crowned Warbler on May 16, 1909. Upon reading this, I referred to my records and found that I had observed an Orange-crowned Warbler, May 15, 1909, at Youngstown, and that this is my only record for this species. I observed it in the early morning in bushes along a small stream. It finally moved along to a brush pile on the bank of the stream where I watched it for perhaps an hour, at times being within 10 feet of it, and identified it to my satisfaction.

Referring to my records again, I find that I listed 20 different species of Warblers on the same day (May 15), 4 of them first arrivals, and some, classed as common, for the first time that season. This indicates that we had here a migration of warblers at that time.

While I was certain of my identification of the Orange-crowned at that time, Mr. Harlow's note, in my opinion, helps to confirm it.— GEO. F. FORDYCE, *Youngstown, Ohio.*

Brewster's Warbler.— In 'The Auk' for October, 1910 (XXVII, pp. 443–447), there appeared an article by Julia Wingate Sherman on Brewster's Warbler. As there are numerous inaccuracies in the account it seems best to point them out and correct them as far as possible.

The history of the Brewster's Warbler about Boston dates from 1907. In that year a male was seen in the Arnold Arboretum by Miss Helen Granger on May 19 (Granger, Auk, XXIV, 1907, p. 343), and was subsequently found breeding (Faxon, Auk, XXIV, 1907, p. 444) with a female Goldenwing. Mrs. Sherman, referring to this pair, writes: " Mr. [C. J.] Maynard sent me a water-color drawing of the female and young, which he made at the time. This female showed an extensive, nearly black throat patch, also a large yellow patch in the wing."

The next year the male Brewster's was seen on May 13 (Peters, Auk, XXV, p. 320), near the same place as the year before. On June 8 I found the nest within a few yards of the spot where the pair was located in 1907. At the time the nest contained five naked young. About the same time the nest was discovered by Mr. George Nelson of the Agassiz Museum and was later taken by him for the Museum. There can be no doubt that the owners of the nest were a male *Helminthophila leucobronchialis* and a female *H. chrysoptera*, as both birds were seen about the nest. About five days after I found the nest the young disappeared, just how will never be known.

A few days after the disappearance of the young birds a nest was found across the road and was believed by Mrs. Sherman and others who did not know of the first to be that of *leucobronchialis*. So far as I am aware the determination of the ownership of the nest was based entirely upon the identification of the female, which was described in 'The Auk' by Mrs. Sherman as having "a dark dusky throat-patch, not clearly defined at its base, but blended into the pale gray of the upper breast.... The black line through the eye was broader and extended back farther than did that on the Brewster of the preceding year. She differed also in showing two yellow wing-bands." This description applies perfectly to the female of *chrysoptera* and as there was a male of this species singing not far from the nest in question it is not at all unlikely that he was the owner and not the *leucobronchialis*, as one might be led to believe.

In 1909 and 1910 the straight male *chrysoptera* was the only bird to be seen; in the Arboretum no female was seen or nest found in either year.

Mrs. Sherman describes (*l. c.*, pp. 444, 445) a pair of Goldenwings which bred in Roslindale in 1910. The male was a typical *chrysoptera*; the female, which had been identified as *leucobronchialis*, had much the same plumage as the one she had just described (see above), but differed in having "the dusky throat patch lighter in color. It bore the same character in being darker towards its center and directly under the bill. The one in 1908 had a nearly black throat patch, mottled slightly in appearance. The black line through the eye was narrower and paled on a pale gray cheek. The white line above the eye was uniform in width.... The white line below the eye was shorter. The whole tone of the back was more olivaceous. Two bright yellow wing-bars divided by an olive or dark band on the wing. The entire underparts were washed with yellow which showed quite bright on the middle of the breast in a good light. The crown was bright dandelion yellow running into bronzy yellow on the back of the head."

This description seems to be a rather good one of a female *Helminthophila chrysoptera* in very high plumage.

It has always been believed that the females in the Arboretum in 1907 and 1908 were *chrysoptera*, and I see no reason why either of these birds or the one in Roslindale should ever be regarded as anything else.— JAMES L. PETERS, *Jamaica Plain, Mass.*

Black-throated Blue Warbler (*Dendroica cærulescens cærulescens*) **Nesting in Sterling, Massachusetts.**— I have been collecting about Lancaster, Mass., since 1897 and I have never found but one Black-throated Blue Warbler's nest until today.

My friend Mr. Herbert Parker told me he had found what he was sure was a Black-throated Blue's nest, in Sterling, which is the next town to

Lancaster, about due west. I went with him the next day (May 28, 1911) and found the nest with the female on it. She glided off and I shot her, to be absolutely sure about the identity. The nest was placed in a laurel bush (*Kalmia latifolia*) about eleven inches from the ground and contained four fresh eggs. It was a typical nest of this species, lined with the dark fibres that are usually used.

Later in the day we found another nest, in a laurel bush, about two feet from the ground. It contained four eggs slightly incubated. As the female was very tame and gave us every opportunity to identify her, I did n't shoot her, as it seemed unnecessary; especially as I had collected the parent bird with the first set.

I located another pair in this same wood, but failed to find their nest.— JOHN E. THAYER, *Lancaster, Mass.*

Notes on a Massachusetts Mockingbird.— The notes on the Mockingbird, published in a recent issue of ' The Auk,' recall to mind some pleasant and interesting observations I made on this species in eastern Massachusetts a few years since. In looking over my notebooks I find under date of June 5, 1908: " An unusual bird visitor seen today. While working in the field my attention was attracted by the (supposed) note of the Crested Flycatcher. I was somewhat surprised to hear it, as this flycatcher is found here only in a few restricted localities. This being outside of the localities where usually found, I hastened to investigate and found that these notes, and a varied collection of others also, came from a Mockingbird. By good fortune he proved to be very approachable, affording a fine chance to see and watch him.

" He was for the most part singing all the time; a pause of a few minutes now and then, during which time he fed more persistently than when singing, although his time when in song, was not entirely devoted to that, but he was frequently changing his perch in order to catch some insect, but making no noticeable pause in song. Much the same style and manner as the Red-eyed Vireo in this respect. I do not know what the powers of mimicry may be for the average mocker but I should think that this one was more than ordinarily skilled in that difficult art.

" A multitude of call-notes and songs of the commoner birds, and some that I hear but infrequently, he ran over apparently as easily as the pianist plays the scale, and with perfect imitation. In many cases not even an acute and practised ear could detect a variation from the genuine. He seemed to be especially well skilled in the performance of the song or calls of the Crested Flycatcher, giving that peculiar inflection one notes in the whistle of this particularly interesting species. Again, without any apparent pause, he would be " whipping-poor-will " with spiteful accent or trilling the amicable " cheer-up " of the robin. The squall of the Blue Jay and also the Jay's more musical bell like note, were rendered with correct expression. The mew of the Catbird and the clicker of the Kingbird, the laughing call of the Flicker, and the Downy Woodpeckers metallic note, all these came in easier and quicker time than I can write. And so on throughout a long list of some twenty to thirty species

"To me, unfamiliar with the mocker before, this was a rare treat. What his own individual song might have been I can only guess, but perhaps a rolling, lyrical song like that of the Brown Thrasher, which came in occasionally as an interlude in his long roll of imitations. No doubt, also, there may have been notes of several southern birds that we here in the north would not recognize, because of unfamiliarity with them; for his song was ever full and varied, shifting from one to another without any warning or apparent aim."

The following list, are species certainly recognized in his imitations:

1. Blue Jay (two notes).
2. Whip-poor-will.
3. Kingbird.
4. Crested Flycatcher.
5. Chebec.
6. Phœbe.
7. Wood Pewee.
8. Red-winged Blackbird.
9. Meadowlark (*Zee-ee-p* note).
10. Baltimore Oriole.
11. Downy Woodpecker.
12. Flicker.
13. English Sparrow.
14. Vesper Sparrow.
15. Song Sparrow.
16. Indigo Bird.
17. White-bellied Swallow.
18. Scarlet Tanager.
19. Red-eyed Vireo.
20. Yellow-throated Vireo.
21. Summer Yellowbird.
22. Maryland Yellowthroat.
23. Chickadee.
24. White-breasted Nuthatch.
25. Catbird.
26. Brown Thrasher.
27. Wood Thrush.
28. Robin.
29. Bluebird.

Besides the above there may have been, as I have previously stated, two or three southern bird notes that I am unfamiliar with. The twenty-nine named were clearly enunciated and readily identified.

This bird remained in the locality for nearly a week and was enjoyed by several persons interested in bird study.—S. Waldo Bailey, *Newburyport, Mass.*

RECENT LITERATURE.

Ridgway on New Forms of Picidæ.[1]— Mr. Ridgway here describes 11 new subspecies of American Woodpeckers and proposes a new genus, *Belanosphyra*, for the *Melanerpes formicivorus* group. Most of the subspecies are tropical, but the following are North American: (1) *Colaptes auratus borealis*, the large form of the Canadian and Hudsonian zones, based wholly on size. (2) *Colaptes chrysoides mearnsi*, from "Arizona, extreme southeastern California and northern Lower California." *C. c. brunnescens* Anthony, omitted from the last A. O. U. Check-List, is also here reinstated. (3) *Centurus uropygialis brewsteri*, from southern Lower California. (4) *Phlœotomus pileatus floridanus*, from peninsular Florida. This, with the recently described *P. p. picinus* Bangs,[2] here also recognized, gives four subspecies of *P. pileatus*, and adds two to the last A. O. U. Check-List. All are based mainly on differences in size, and on the fact that corresponding subspecies are recognized for the corresponding areas in the *Dryobates villosus* and *D. pubescens* groups.— J. A. A.

Oberholser on the Flycatchers of the Genera Hypothymis and Cyanonympha.[3]— The genus *Hypothymis* consists, as here recognized, of 4 species and 16 additional subspecies, of which 15 are subspecies of *H. azurea*, for the most part insular forms; 11 of the subspecies are here first distinguished; most of the others were originally described as species. The group ranges from southern India to the Philippines, Sumatra, Borneo, Celebes, and Java, including the numerous smaller outlying islands. The new genus *Cyanonympha* consists of *Hypothymis superciliaris* and its subspecies *samarensis*, from the southern Phillippines. Keys are given to the species and subspecies, and tables of measurements of large series of specimens of many of the forms recognized. The monograph is based mainly on the collections made by Dr. W. L. Abbott, with other material in the U. S. National Museum, numbering altogether (including a few borrowed) 205 specimens.— J. A. A.

Roberts's 'The Evening Grosbeak in Minnesota.'— This paper[4] was "prepared in its present form for publication in a 'Report on the Birds of Minnesota' in course of preparation by the Minnesota Natural

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[1] Diagnoses of Some New Forms of Picidæ. By Robert Ridgway. Proc. Biol. Soc. Washington, Vol. XXIV, pp. 31–36. Feb. 24, 1911.

[2] Proc. New England Zoöl. Club, IV, p. 79. April 2, 1910.

[3] A Monograph of the Flycatcher Genera *Hypothymis* and *Cyanonympha*. By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. National Museum, Vol. XXXIX, pp. 585–615. Feb. 28, 1911.

[4] The Evening Grosbeak in Minnesota. A. O. U. No. 514. *Hesperiphona vespertina vespertina* (W. Cooper). By Thomas H. Roberts. Bull. Minnesota Acad. of Science, Vol. IV, No. 3 (1910), pp. 406–414.

History Survey," where it will eventually appear in a probably much condensed form. It contains at present an annotated synonymy of Minnesota references, arranged chronologically, and a detailed description of the species, followed by an extended account of its manner of occurrence in Minnesota, with localities of occurrence, and migration dates for both fall and spring, running back to the earliest known record of its occurrence. Its habits during its stay in Minnesota, which is often prolonged till late in May, are described in detail, including its haunts, food, song, and general behavior. This is followed by transcripts from the original account of the species given by William Cooper in 1825, in the first volume of the 'Annals' of the Lyceum of Natural History of New York. Its beautiful plumage and pleasing song render it an exceptionally attractive species. Says the author: "A life time may be spent in close intimacy with birds and yet the clear whistle or a gleam of the unique tricolored vestments of the Evening Grosbeak, never fails to secure a pause in one's occupation and a moment passed in admiration and wonderment. Until the remarkable and previously unnoted advent of thousands of these birds into the whole northeastern portion of the United States in the winter of 1889–90 the Evening Grosbeak, except in a few favored localities, was a veritable will-o'-the-wisp, a sort of disembodied bird-spirit to most ornithologists."— J. A. A.

Beetham's 'Photography for Bird-Lovers.'[1]— Mr. Beatham's fitness to prepare what may be called a practical manual of Bird-Photography has been shown in his 'The Home-Life of the Spoonbill,' etc., already noticed in these pages (*antea*, pp. 132, 133). The present work is divided into twelve chapters, the first of which is an introduction relating to the general subject, followed by chapters on apparatus, nest-photography, photographing young birds, photographing by the stalking method, by the concealment method, by concealment and artificial attraction, by rope-work on the cliff-face, photography of birds in flight and in captivity, and on bird-photography in color and in cinematography. The subject of apparatus is considered at considerable length, based on the author's ample experience, and will doubtless prove very helpful to beginners in bird-photography in securing a proper equipment. The author treats fully of the difficulties met with in nest-photography and the devices that may be used to secure successful results; also of stalking and hiding, and of methods of concealment, etc., with hints on focussing at nests, the difficulties met with in cliff work, and instructions for color photography and cinematography work. In short, the whole field is apparently well covered in an exceedingly practical way. The half-tone illustrations are not only interesting and beautiful, but have in most instances a direct relation to the instructions given in the text.— J. A. A.

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[1] **Photography for Bird-Lovers A Practical Guide By Bentley Beetham, F. R. S. Author of "The Home-Life of the Spoonbill the Stork, and Some Herons With Photographic Plates London Witherby & Co 326 High Holborn W C 1911 — Sq. demy 8vo pp xi + 128 with 16 full-page half-tone plates and several text illustrations. Price 5s net.**

Matthews's 'Birds of Australia.'— Part 3[1] of this work, bearing the date April 29, 1911, concludes the account of the Pigeons, of which twelve species are here figured and described, and two additional subspecies are described. While similar in plan and execution with previous parts, the historical and biographical matter is usually restricted to a few quotations from previous writers, and thus much less extended than in Part 1, or than the prospectus might lead one to expect.— J. A. A.

Menegaux on the Birds of Ecuador.[2]— This report is based on a collection of 885 specimens collected by Dr. Rivet during five years of service as physician to the French Geodetic Survey, 1899–1906, in northern central Ecuador. After a short historical account of previous ornithological work in this region the author proceeds to give in systematic sequence a list of the 274 species obtained, exlusive of the Hummingbirds (33 species) previously reported upon by M. Simon (*cf. antea*, p. 133). The specimens obtained are enumerated, with their localities and more or less descriptive comment, under their respective species, with reference to previous records for the region, and a brief statement of the range of the species and a citation of the place of original description and type locality. The list adds a considerable number of species not previously recorded from the region.

The systematic list is followed by several pages on the climatic and topographic features of the region, with lists of species characteristic of the different climatic and faunal districts, and by a bibliography of about 50 titles. The four colored plates illustrate *Tinamus latifrons* Salvad., *Odontophorus melanonotus* Gould, *Grallaria gigantea* Lawr., and *Philydor columbianus riveti* Meneg. & Hellm.— J. A. A.

Hellmayr's 'The Birds of the Rio Madeira.'[3] — The present paper of nearly 200 pages is presented " as a complete résumé of our present knowledge of the Ornis of the Madeira region," here restricted " to that portion of the stream from Borba upwards to the junction of the Beni and Guaporé Rivers." For this area 464 species and subspecies are here recorded.

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[1] Birds of Australia, by Gregory M. Matthews. Part 3, April 29, 1911. Royal 4to, pp. 137–184, pll. xxxiv–xliv, colored. Witherby & Co., London.— For notice of previous parts see antea, pp. 135 and 289.

[2] Étude des Oiseaux de l'Équateur rapportés par le Dr. Rivet. Mission du service géographique de l'Armée pour la mesure d'un Arc de Méridian equatorial en Amérique du Sud, 1899–1906, tome IX, pp. B. 1–B. 128, pl. i–iv (colored).

[3] The Birds of the Rio Madeira. By C. E. Hellmayr. Novitates Zoologicæ, Vol. XVII, pp. 257–428. December, 1910.

The basis of this report is a collection of 2000 specimens collected by Mr. Wilhelm Hoffmanns in 1906, 1907, and 1908, for the Tring Museum. In addition to this material the author has had access to the Natterer collection in the Vienna Museum, and to specimens in Count Berlepsch's collection. The collector, Mr. Hoffmanns, suffered much from malaria while forming this important collection, and unfortunately died from pneumonia soon after his return to his home in Germany.

The specimens are listed under their respective species, with the dates and localities of collection, while measurements are given of wing, tail and bill, and the collector's notes on the color of the iris, feet and bill from the freshly killed specimen. References are given to previous pertinent records, and there is much technical comment relating to the geographical ranges and affinities of the forms recorded, and on points of nomenclature, etc. The ranges of allied forms and their distinctive points are given in synoptical form for many groups of subspecies, this rendering the report of special convenience and value to future workers in South American ornithology. The critical notes and references are of special importance in connection with previous records. The first reference in the synonymies is to the place of first description, and includes the type locality, if definitely given originally or since assigned, and now assigned if not previously fixed. In short, the report is made up in the same careful and critical manner that has characterised the author's previous faunistic papers.

A geographical summary at the close of the account states that only species that have actually been taken in the Madeira district have been included. The avifauna is said to show a mixed character, with some 30 species peculiar to it, while not a few are found on one bank of the river that do not cross to the other.— J. A. A.

'**Feathers and Facts**.'— Under this title[1] The Royal Society of Great Britain for the Protection of Birds has issued a statement on the subject of the trade in the plumage of wild birds, giving a brief history of its growth and of the protest and condemnation that have arisen against it. Its main purpose is to disprove various misstatements and allegations put forth by the feather trade defense in their organ 'The Feather Trade.' Among these are: the old story that 'osprey' or aigrette plumes are not feathers at all, thus deceiving thousands of women into buying egret plumes by the false assertion that they were not egret feathers but an artificial product; and, this having been proved false, the story that the plumes sold were moulted feathers 'picked up' by hunters, and that egrets were "protected by law and custom throughout countless miles of the South American continent," while the condition of the country concerned, and the jungles and swamps where the birds breed, render the enforcement of such a law, even if it really existed, simply impossible.

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[1] Feathers and Facts: A Reply to the Feather-Trade, and Review of Facts with Reference to the Persecution of Birds for their Plumage. 8vo, pp. 74. London: Printed for The Royal Society for the Protection of Birds, 23 Queen Anne's Gate, S. W., by Witherby & Co., 326 High Holborn, W. C. Price sixpence.

The pamphlet deals also with the reckless destruction of Hummingbirds, Goura Pigeons, Himalayan Pheasants, Paradise Birds, Lyre Birds, Storks, Pelicans, Grebes, etc., and exposes the false assertions of the feather dealers regarding the limited extent and slight importance of the feather trade in diminishing the numbers of any of these species.

The subject of the prohibition of the importation of plumage and of international laws to prevent it, is also presented at length. The paper has thus a broad scope, and is especially important in its analysis of the feather trade defense. It is a strong document that should have the widest possible circulation.

Another recent brochure dealing with misleading statements of New York milliners engaged in the Heron plume traffic is entitled 'Confessions of a Plume Hunter,' and forms Special Leaflet No. 23 of the National Association of Audubon Societies. It is in the form of a sworn statement, addressed to the Secretary of the Association, by Mr. A. H. Meyer, formerly in business as a plume collector in Venezuela and Colombia for twelve years (1896–1905, inclusive). After citing the fact that certain commercial interests in New York City are circulating stories "to the effect that the aigrettes used in the millinery trade come chiefly from Venezuela, where they are gathered from the ground in the large garzeros or breeding colonies of white herons," he goes on to state, from his own personal knowledge, that "It is the custom in Venezuela to shoot the birds while the young are in the nests," and that after the breeding season the plumes are virtually of no commercial value, "because of the worn and frayed condition to which they have been reduced." A few of the plumes of the large white herons are picked up about their breeding places, but they are of small value and are known as 'dead feathers.'

The impossible stories circulated by the millinery interest in New York are stated to be based on a letter written by "Mayeul Grisol, Naturalist and Explorer of the Honorary Mission of the Museum of Natural History in Paris." The absurdity of these statements led Prof. Henry Fairfield Osborn, President of the American Museum of Natural History in New York, to cable an inquiry to the Paris Museum of Natural History regarding Mayeul Grisol. The reply, dated April 22, 1911, was: "Mayeul Grisol inconnu" — J. A. A.

Boas on Rooks and on Damage done by them in Denmark.[1]— The writer treats his subject under the following headings: Food of Rooks; Rooks useful or injurious? How shall we estimate the economic significance of Rooks? Distribution of Rooks in Denmark; Experience with injury by Rooks in Denmark; Summary of damage; Comparison of injuries and benefits; Means against Rooks, and Legislation against Rooks.

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[1] Boas, J. E. V. Raagerne og raageskade i Danmark. Tidssk. f. Landbrugets Planteavl. XVIII, 1911. Separately paged [1–29], 1 map.

The first three headings cover a discussion of articles on Rooks by Gilmour, Rörig, Schleh, and Hollrung, in which the results of stomach examinations are set forth and commented upon. The distribution of Rooks in Denmark is considered in detail and is illustrated by a map which shows the location of breeding colonies, and also localities where Rooks are definitely reported not to breed. It appears that Rooks are confined to the eastern part of the kingdom.

Seven pages are taken up with the reproduction of letters giving experience with injuries by the Rooks. This testimony is then summarized. The principal damage seems to be to seed grain, potatoes, and turnips. Grain is pilfered from shocks as well as from newly planted fields, and both seed potatoes and the young tubers are dug out and devoured. Although Rooks visit patches of young turnip plants in search of insect larvæ they do more harm than good by trampling down and killing the tender seedlings. The birds do minor damage by scratching manure away from plants, by general depredations in out-lying gardens, by stealing cherries, robbing partridge nests, and digging up seeds in forest nurseries.

The author's conclusion is that the Rook is an important injurious species, responsible for an annual loss to the agriculturists of Denmark, which must be reckoned in hundreds of thousands of crowns (crown = 26.8 cents). Some individuals lose thousands of crowns but the loss falls mainly upon the small holders. It is evident, he says, that the Rook is a bird which we must combat.

Among methods of fighting Rooks those recommended as most effective are taking the eggs and young from the nests, and felling trees containing nesting colonies. Shooting through the nests in the evening after the birds have gone to roost also is advised, and the author naively remarks that this is particularly disagreeable to the Rooks. The adults leave and the young die.

The article closes with a section on legislation against Rooks and a bibliography of 17 titles.— W. L. M.

Huntington's 'Our Wild Fowl and Waders.'[1]— It is apparent to all who have given much thought to the matter, that there can be but one ultimate result of the time-worn American system of protecting game only by restrictive legislation, and that result is extermination of the game. Of what avail is it to shorten the season or to reduce the bag limit, when the number of hunters greatly increases every year? Manufacturers of guns and ammunitions expend fortunes in extending their business, but they as well as the gunners themselves must be made to realize that there is a limit to the increase of hunting. If they push blindly forward to that limit, both business and sport, insofar as they depend on the existence of game birds, will vanish.

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[1] Huntington, D. W. Our Wild Fowl and Waders. Amateur Sportsman Co., New York. Dec., 1910. 207 pp.

Of earlier origin than any system of game laws is the idea that wild life may freely be drawn upon at either the need or the pleasure of man. Savages secure a great part of even their vegetable food from nature, but how shiftless a man would be considered who would depend upon the same source now. The early settlers of America found game in apparently inexhaustible abundance, and naturally used it freely. The idea has largely persisted that we have a right to take game at any time for food, but this fallacy should be as apparent as the older one of depending upon wild vegetable products. The mere acceptance of the civilized state carries with it the principle that one has no right to food which he has not helped (either directly or by equivalent) to produce.

A very high percentage of the shooting of North American wild fowl and waders is in no wise necessary to supply food (the shooters being chiefly overfed rather than the reverse). Being undertaken solely in the name of sport, the disastrous effects of this gunnery upon the game birds, and the practical failure of the sportsmen to do anything toward the increase and preservation of birds are wholly inexcusable.

Mr. Huntington points out the hopelessness of game laws to restore game, shows how the restriction of the best breeding grounds for ducks makes it impossible for them to bear up under the increasing slaughter, and devotes most of his pages to instructions for making game locally abundant, by which means the utter extinction of many species can be prevented. The author terms his book the first "for American readers on the practical conservation of game. It deals with the methods of propagation and preservation which are essential to make game abundant and keep it plentiful in places where field sports are permitted."

Mr. Huntington drew his inspiration, he tells us, from the discovery of English game keepers that "the wild duck could be preserved and made abundant for sport and for profit by the hand-rearing process, which was known to work well with pheasants and other game....More than ten thousand ducks were reared in a season at Netherby Hall, and the skilled gamekeeper who achieved this remarkable success proved that big bags of ducks can be shot safely every season." This success has already been approached on American preserves. The author thinks that "the breeding of wild ducks should interest the farmers as well as the sportsmen, since so many small swamps and waste places can be utilized for profit."

A chapter is devoted to a general consideration of ducks, geese and swans, in which is pointed out the adaptability of the various species to artificial propagation. The following rather lengthy chapter gives evidence of the practicability of rearing large numbers of ducks in an essentially wild state and describes some successful preserves. It is shown that wild ducks will breed in close proximity to some of the most disturbing features of civilization, if only their little home shelter is secure. Freed from meddling they go along contentedly with their family cares in the most unlikely places. The best types of ponds, cover and fencing are described. The following American game farms are mentioned: Oak

Park, Ill.; Yardley, Pa.; Clifton Forge, L. I.; Hudson Highlands, N. Y.; and Chincoteague Island, Va. Stock can be secured from these and from English preserves.

Rather scanty information on the natural foods of wild ducks was available to the author, but the addressses of the principal dealers in the better known plants are given, as is also an interesting letter from Dr. R. V. Pierce, who has experimented extensively with the propagation of aquatic plants which are eaten by ducks. Many of the scientific names in this chapter are misspelled, and in discussing publications of the Bureau of Plant Industry, on wild rice, the unguarded statement is made that "It seemed hardly worth while for one department of the Government to issue expensive bulletins telling the people how to produce foods for breeders when another department was actively interested in game laws prohibiting such industry." This statement is negatived by a later one (p. 160) concerning "the profitable increase of game by breeders" which is as follows: "The Bureau of Biological Survey of the U. S. Department of Agriculture favors such legislation, and it seems probable that the laws soon will be amended so as no longer to prevent the profitable increase of a desirable food."

The most interesting part of the book of course is that dealing with the artificial rearing of wild ducks. The provision of suitable nesting places and the fencing out of ground vermin are mentioned among the essentials. Eggs are taken from the ducks until one or two clutches are obtained from each. These are placed under hens which are cared for in a hatching house lined with row upon row of nest boxes. About 20 to 33 eggs are laid by each duck in a season, although 119 have been laid by two ducks which were given an abundance of animal food. The ducks after furnishing 15 to 20 eggs are themselves allowed to lay and incubate a clutch. It has been found that duck eggs require a considerable supply of moisture; they are sprinkled daily and the nest is saturated just before hatching time. For this reason artificial incubators have not found favor, but the author worked out a method by which at least one satisfactory hatch was accomplished.

The young ducks thrive best when fed upon a meal containing a proportion of animal food. They are fed this meal until they are two to three weeks old, an increasing quantity of cracked corn bring added as they grow older. The young are not taken to water until seven to eight weeks old, a thorough wetting earlier usually having very bad effects.

After turning out where natural food is abundant only one meal a day is required. This should be given at an established feeding place on the water side, which is fenced against vermin. The ducks will then regard this spot as a refuge, and make it headquarters for their excursions to the surrounding country. They quickly learn to come to meals on signal, and although becoming tame as barnyard fowl on their familiar feeding grounds they are timid and wary when visiting other places.

This behavior is analagous to that of wild birds in certain of our public parks, as at New York, Boston, and San Francisco, or such localities as Lake Worth, Fla., where certain areas are sanctuaries. So eager for protection and appreciative are the ducks, that such refuges should be made in all parts of the country.

The book fairly bristles with admonitions to keep down vermin, which is defined as "the natural enemies of game birds collectively." The term is very indefinite therefore and must be interpreted according to the prejudices of the gamekeeper concerned. Chapters are given on the natural enemies, collectively, on winged vermin and ground and water enemies. These categories include eagles, crows, hawks, gulls, owls, English sparrows, magpies and jays, the fox, coyotes, minks, weasels, raccoons, skunks, cats, rats, snakes, moles, turtles and fishes. The worst are thought to be the crow, fox, mink, weasel, cats and rats. Carp are mentioned as destroyers of duck food.

Although vermin are given too much importance in the book, the author himself evidently holds very reasonable views on the subject. It is only to be feared that these are buried in such a mass of charges against vermin that their effect will be lost. Mr. Huntington says: "The naturalists are right no doubt in saying that many species of vermin are beneficial and that they do not do as much harm as some gamekeepers imagine they do. Laws, however, which prohibit the killing of game enemies should not apply to game farms and preserves." It should be added, nor should bird protection laws of any kind fail to provide for the relief of property manifestly being damaged. The author well says that "it would be quite as logical to say that the shepherd must not kill the wolves as it is to say that the breeder of game must not control the enemies which kill his game." The matter should, however, be the subject of sufficient supervision to prevent abuses.

"The idea that it is not necessary or desirable to exterminate all vermin seems to be gaining ground.... A good rule to follow is to control the natural enemies of game only when they appear to be doing serious damage. A hawk trap recently has been invented in England which captures the hawks alive. The hawks which do very little damage and which are regarded as beneficial birds can be released."

Methods of destroying various pests are given, the principal one recommended for birds being use of a decoy owl and shooting from a blind. A gamekeeper at Oak Park, Ill., killed 2,410 crows in one season.

Mr. Huntington says: "The reader will find the hawks discussed at length in a bulletin issued by the United States Department of Agriculture, but in reading it he should remember that the conclusions stated are founded largely upon stomach examinations and that such evidence is not always reliable"; and adds in a footnote: "The marsh hawk is classed as a beneficial hawk by ornithologists but I shot one which had a quail in its talons as it flew overhead." Here is the old, old mistake of allowing an isolated individual observation to weigh heavily against a careful estimate formed after consideration of all the available information, together with the results of an investigation planned especially to bring out all the facts in the case. The insinuation is made that results founded upon stomach examination are essentially unreliable. The fact is that this method was adopted and is maintained principally because of the glaring insufficiency and incorrectness of field observations. It must be remembered that, given a sufficient number of stomach contents, evenly distributed chronologically and geographically, we have evidence, more exact than is obtainable in any other way, of the usual subsistence and hence of the economic significance of a species. The fact that a stomach examination reveals the nature only of a single meal, is of no importance, when a dozen or more stomachs are often collected in the same locality at about the same time.

Gamekeepers should not be too quick to disregard the findings of economic ornithologists as to the value of hawks, owls and other birds, especially as some of their worst vermin, as rats, snakes, etc., are customary food of these birds.

Mr. Huntington points out the availability of the grounds of many established ducking clubs for the purpose of propagating game, and suggests that the clubs take up the work both for their own welfare and the preservation of game birds as a group. Suggestions as to the formation of duck propagating clubs or syndicates are given, together with estimates of expenses.

A chapter entitled "The restoration of wild fowl" discusses the use of decoys for luring wild birds to ponds, and the most judicious shooting of the wild birds. It would bear more becomingly the title "The destruction of wild fowl." Description of the methods of shooting followed on preserves, so as not to drive away the ducks, nor impair the breeding nucleus, forms the subject of another chapter.

The diseases also of wild ducks are discussed and a letter on the subject from the chief of the Bureau of Animal Industry shows that the great Bear River, Utah, epidemic was coccidiosis, a result agreeing with those reached in all previous scientific investigations of epidemics among ducks in the United States.

A special chapter on propagating wild geese gives the experience of Mr. Whealton of Chincoteague Island, Va., and Mr. Warren R. Leach of Iowa (?). The shorebirds are briefly mentioned as profiting by the protective measures employed on duck preserves.

Mr. Huntington's share of the book closes with arguments for legislation favorable to game farming, and with the text of a proposed law for breeders.

An appendix contains accounts by Prof. W. W. Cooke of the distribution and migration of the principal game ducks.— W. L. M.

Papers on Tick-eating Birds.— Dr. A. Fredholm publishes in Trinidad,[1] the observations[2] of Newstead on the natural enemies of ticks in

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[1] Proc. Agr. Soc. Trinidad. X. Part 7. July. 1910. pp. 258–263.

[2] Bull. Jamaica Dept. Agr., Vol. I. No. 3. April. 1910. pp. 161–165.

Jamaica, which have previously been reviewed.[1] Mr. D. W. May in an article[2] on Cattle in the West Indies, mentions a blackbird of Porto Rico that follows the cattle about and picks the ticks off of them. He says: "I have seen them grasping the tail with both feet and feeding upon the ticks infesting the hind quarters of the animal. They will also stand upon the ground beneath the animal and jump up picking ticks, getting one at each hop. To this bird is largely due the fact that in our fields ticks are not so plentiful as in the Southern States." This bird undoubtedly is *Quiscalus brachypterus*, the species mentioned by Bowdish[3] as feeding on vermin on cattle near Mayaguez.— W. L. M.

Grinnell on 'The Linnet of the Hawaiian Islands.'[4]— The paper is an important discussion of color as found in the *Carpodacus mexicanus* group of birds, and the principal facts on which it is based are summarized in the following quotation: "A series of male Linnets collected in the Hawaiian Islands in 1910 are all of the yellow or orange type of coloration. The Linnet of the Hawaiian Islands is known to be of exotic origin. It is believed to have been introduced less than forty years ago, the imported individuals having been obtained in the vicinity of San Francisco, California, where the common *red* type is known to have prevailed ever since birds have been observed in the region, a period of sixty years at least."

For an explanation of the color variations, the author inclines to the latest biological theories as shown by citation of another paragraph, viz.: "A deficiency in capacity, of the germ, for the formation of the appropriate enzyme may have been intensified through close breeding until the condition was reached where the amount of enzyme produced in the feather anlage is insufficient to carry on oxidation of tyrosin beyond the yellow, or at farthest, the orange stage." He admits that "the explanation offered is tentative to the last degree," but what is more surprising is that he virtually excludes food as a possible factor in producing these results.— J. D., Jr.

Grinnell on 'The Modesto Song Sparrow.'[5]— If this new form, *Melospiza melodia mailliardi*, takes rank with its predecessors it will bring the number of recognized races up to twenty-one. The form *heermanni* once occupied alone the central valleys of California, where now there are several aspirants of which this is the newest.— J. D., Jr.

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[1] Auk, XXVIII, Jan., 1911, p. 136.

[2] Porto Rico Hort. News, III, No. 4, April, 1910, p. 59.

[3] Auk, XX, Jan., 1903, p. 13.

[4] The Linnet of the Hawaiian Islands: A Problem in Speciation. By Joseph Grinnell. Univ. of California Pub. in Zoöl., Vol. VII, No. 4, pp. 179–195.

[5] The Modesto Song Sparrow. By Joseph Grinnell. Univ. of California Pub. in Zoöl., Vol. VII, No. 5, pp. 197–199.

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NOTES AND NEWS.

Henry A. Purdie, a Fellow of the American Ornithologists' Union, died in Boston, Mass., March 30, 1911.

Mr. Purdie was not only one of the Founders of the American Ornithologists' Union, but one of the original members of the Nuttall Ornithological Club of Cambridge, which was organized in 1873, to which for many years he rendered devoted service as its secretary, and was for many years a frequent contributor to its 'Bulletin,' and later to its successor 'The Auk.'

By those who knew Mr. Purdie intimately he will ever be most affectionately remembered, for few men were so sincere, conscientious and self-sacrificing in their friendships. His contributions to ornithology had reference mainly to the birds of New England, respecting which he was long recognized as a competent authority. His relations with the members of the Nuttall Club were intimate and sustained until the end. It is hence exceedingly fitting that the President of the American Ornithologists' Union has selected his intimate and life-long friend, Mr. William Brewster, to prepare the memorial of his life and work, to be read at the next Stated Meeting of the Union and published later in 'The Auk.'

George Ernest Shelley, a Corresponding Member of the American Ornithologists' Union, died in London, November 29, 1910, after a long illness, at the age of 70 years. He was born in 1840, the son of John Shelley of Hants, and a nephew of the famous English poet, P. B. Shelley. He was privately educated in England and at the Lycée de Versailles in France. In 1863 he joined the Grenadier Guards, retiring a few years later with the rank of Captain. Shortly after he was sent by the Government to South Africa as a member of a geological commission to make a survey of that region, but his interests were soon diverted to ornithology, to which he became enthusiatically devoted during the remainder of his life. His first ornithological papers appeared in 'The Ibis' in 1870, and, like most of his numerous subsequent ornithological writings, related to African birds. His principal works are a 'Handbook to the Birds of Egypt' (1872), 'Monograph of the Nectarinidæ, or Family of the Sun-birds' (1876–1880), Catalogues of the Families Indicatoridæ, Capitonidæ, Cuculidæ, and Musophagidæ, in Volume XIX of the British Museum 'Catalogue of Birds' (1891), and 'Birds of Africa,' the first volume of which appeared in 1896, followed by Volumes II (1900), III (1902), IV (1905), and Part I of Volume V (1906).[1] In 1906, a stroke of paralysis brought his labors to a close, leaving this great work unfinished. Arrangements have been made for its completion by our Corresponding Member, Mr. William L. Sclater, formerly Director of the South African Museum, and author of the 'Fauna of South Africa.'

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[1] Notices of his 'Birds of South Africa' appeared in this journal as follows: Vol. XVIII, 1901, pp. 122, 123; XIX, 1902, p. 414; XXII, 1905, pp. 228, 332; XXIII, 1906, p. 353.

From Mr. R. Edgcumbe's biographical notice of Captain Shelley (Ibis, April, 1911, pp. 369–376) we take the following tribute to his memory: "Captain Shelley was for many years an active member of the British Ornithologists' Union, and from 1870 to 1894 [1901] made numerous contributions, chiefly on African birds, to the pages of 'The Ibis' [and to the 'Proceedings' of the London Zoölogical Society], as will be seen by our List of his principal publications. He possessed great natural abilities, with something of that genius which has made the family-name famous. Gifted as he was by nature, he might have turned his mind to anything, and would have made his mark in almost any direction. He possessed a wonderful memory, an infinite capacity for taking pains, and a facility for literary expression, attributes in which he resembled his celebrated uncle, the Poet. In youth he strongly resembled the Poet in personal appearance....To the last hour of life Captain Shelley was distinguished by that inborn gentleness, modesty, and courteous bearing which constitute, in the highest sense, the well-born gentleman...

"In 1889, Captain Shelley married Janet, daughter of the late Mr. E. Andrewes, who, with two sons and a daughter, survives him."

DR. GUSTAV EDLER VON HAYEK, a Corresponding Member of the American Ornithologists' Union, died at his home in Vienna on January 9, 1911, in the 76th year of his age. He was born at Brünn in 1836, and on completing his studies at Vienna entered the navy, serving for a time as ensign. On leaving the navy in 1863, he took up the study of natural history under Hyrtl, Brühl, Hochstetter and Kornhüher, later becoming Kornhüher's assistant, and, in 1869, Professor in the then newly established Realgymnasium, which position he continued to fill till the year 1900, when he retired and was pensioned.

In 1880 he took charge of the Ornithologische Verein in Vienna, of which Crown Prince Rudolf was patron. At the International Ornithological Congress held in Vienna in 1884, the International Ornithological Committee was organized with Dr. von Hayek as chairman, which office he filled for many years.

Dr. von Hayek was also active as an author. Among his best known works are 'Der illustrirte Handatlass aller drei Reiche' and 'Handbuch der Zoologie,' in four volumes. He was honored with the Kriegsmedaille for Kunst and Wissenschaft, and received many foreign decorations, among them French and Russian. His sons are Dr. August Edler von Hayek and Dr. Paul Edler von Hayek.— A. v. H.

DR. CARL PARROT, late president of the Ornithologische Verein in Bayern, and editor of its publications, died at his home in Munich, January

28, 1911, at the age of 44 years. He was born in Castell, Unter-franken, February 1, 1867, the son of a physician. In 1884 he moved with his parents to Munich, where, and in Berlin and Vienna, he studied medicine and became a practising physician. From an early age he was strongly interested in ornithology, to which in his later years he devoted much of his time and energy. He was one of the founders of the Ornithologische Verein München, in 1897, which in 1904 became the present Ornithologische Verein in Bayern, of which he was the first president, filling this office till his death, and also conducting its publications. He was especially interested in bird migration and distribution, and a strenuous supporter of bird protection; he was also an excellent systematic ornithologist, and the author of many important papers on Bavarian ornithology, and on collections of birds from various parts of Asia and elsewhere. The April Heft of the 'Journal für Ornithologie' (LIX Jahrg., pp. 345–350) contains an appreciative sketch of his life and ornithological work by Dr. E. Schnorr V. Carolsfeld, with a portrait and a list of his ornithological writings.

A PROSPECTUS of a work on 'Eggs of Birds breeding in the Netherlands,' by A. A. Van Pelt Lechner, has been issued by the publisher, Martinus Nijoff, The Hague. The work (also called 'Oologia Neerlandica') will be issued in seven parts of from 30 to 35 plates each, making a total of 191 plates, with 608 colored and 59 uncolored figures. The edition will be limited to 250 copies, of which 100 are in English. A page of text will face each plate. The subscription price is seven guineas. The sample plate (eggs of the Raven) indicates that the illustrations will be well executed.

DR. FREDERIC A. LUCAS, recently Curator of the Museum of the Brooklyn Institute, and formerly in charge of Osteology in the U. S. National Museum, has been made Director of the American Museum of Natural History in New York City, to succeed Professor Hermon C. Bumpus, who recently resigned to accept the position of Business Director at the University of Wisconsin. Dr. Lucas entered upon his duties at the American Museum on June 15.

MR. A. C. BENT, of Taunton, Mass., whose contemplated expedition to the Aleutian Islands has already been announced (*antea*, p. 292), sailed from Seattle, Wash., with several assistants, in the U. S. Revenue Cutter 'Tacoma,' on May 19 for Attu Island. The expedition is well equipped and its summer's work can not fail to make important additions to our knowledge of the fauna and flora of the Aleutian chain.

IN 'The Auk' for April, 1911 (p. 292) mention was made of Dr. Charles H. Townsend's expedition in the 'Albatross' to Lower California, in the interest of the American Museum of Natural History and other scientific institutions. The work of the expedition was completed about the end of April, and we are greatly indebted to Director Townsend for the following summary of its operations and results.

"During the months of March and April, 1911, the U. S. Steamship 'Albatross' was engaged under my direction, in fishery and hydrographic work in waters adjacent to Lower California. By a fortunate arrangement with the Bureau of Fisheries, a zoölogical and botanical reconnaisance of the coastal region of the Peninsula was made in connection with the usual marine investigations of the vessel.

"The ship carried a scientific staff of eight persons, representing the American Museum of Natural History, the New York Zoölogical Society, the New York Botanic Museum, and the U. S. National Museum. The Naval staff of the Albatross, under Commander Burrage, took an active interest in the shore work and assisted in making the expedition a success in every way.

"In addition to the deep-sea work, which yielded highly satisfactory results, thirty-six anchorages were made along the east and west coasts of Lower California, and the shore collections constitute an important part of the material brought back by the ship.

"The collection of birds alone numbered 655 specimens, representing 127 species and subspecies. Some of these were from Tiburon and other islands in the Gulf of California hitherto unexplored, and coming from new and isolated localities may prove to be undescribed forms. On Tiburon Island 12 species of land birds were secured. Other outlying islands visited were Guadelupe, San Benito, Cedros, and San Roque in the Pacific, and Ceralbo, Espiritu Santo. Santa Cruz, Santa Catalina, San Josef, Carmen, Angel Guardia, and San Esteban in the Gulf.

"The bird collection is large considering the fact that the duration of the cruise was limited to two months, and only a portion of the time could be devoted to shore work. The time at each anchorage was limited to one or two days. The list of birds will soon be augmented by collections expected from one of the party, Mr. Pingree Osborn, who was left at San José del Cabo, to make a trip into the Sierra Laguna Mountains after forms restricted to the Cape Region.

"Among the species of birds obtained, there is a good representation of those peculiar to Lower California and the outlying islands. The electric lights of the ship sometimes aided the bird collectors — eleven specimens of Storm Petrel (*Oceanodroma kædingi*) attracted by the electric lights, were captured on board during the night the ship anchored off Guadelupe Island. Our naturalists did not by any means devote their entire time to birds. The collection of mammals numbered 195 specimens, and of lizards and snakes there were nearly 1000.

The botanical gatherings alone occupied nearly half of the special freight car to which the ship's load was transferred at San Francisco.

"A large collection of fishes and invertebrates was obtained along shore, while the deep-sea dredgings, carried out to depths of 1760 fathoms (2 miles), were rich in new and interesting forms. Among the more striking products of the cruise for museum purposes, were the numerous plaster casts made of deep-sea fishes. The most picturesque feature was the re-discovery at Guadelupe Island of the supposed extinct elephant seal. Three males, each 16 feet long, were killed, and six yearlings were shipped alive to the New York Aquarium. Moving rapidly from point to point as we did, the ornithological and other shore work could not be carried very far inland, nor could the work of collecting be made as thorough as was desirable. The naturalists however made the best possible use of each day ashore, and slept comfortably on board at night while the ship was under way to the next anchorage."

Mr. Frank M. Chapman, Curator of Birds in the American Museum of Natural History, who, with Mr. Louis Agassiz Fuertes and Mr. Leo Miller, sailed from New York City for Colombia on March 13 (see *antea*, p. 291), returned on June 15. He landed at Buenaventura, on the west coast of Colombia, on March 24, where he connected with Mr. W. B. Richardson, who had for some months been collecting for the Museum on the west slope of the coast range. The first camp was established on the summit of the coast range, and here material was collected for a Habitat Group, illustrating the bird life of the humid forests, and showing, in the background, the Cauca Valley and the central range of the Andes. The second camp was made in the Cauca valley near Palmira. From this point the expedition ascended the main chain of the Andes, returning thence to other points in the Cauca Valley, and finally to Cali, which formed the base of operations. On May 13, Mr. Richardson, with Mr. Leo Miller, as assistant, was despatched southward to the vicinity of Popayan, while Mr. Chapman and Mr. Fuertes went down the Cauca River to Cartago, thence across the central range of the Andes to Giradot on the Magdalena. The Magdalena was then descended to Barranquilla, and from Barranquilla a short trip was made through the marshes to Santa Marta, from which port a steamer was taken for New York. In addition to collecting material for a Habitat Group, Mr. Chapman's work was designed primarily to be a reconnaisance to secure information which would enable the Museum more effectively to prosecute the biological work it has in view in Western Colombia.

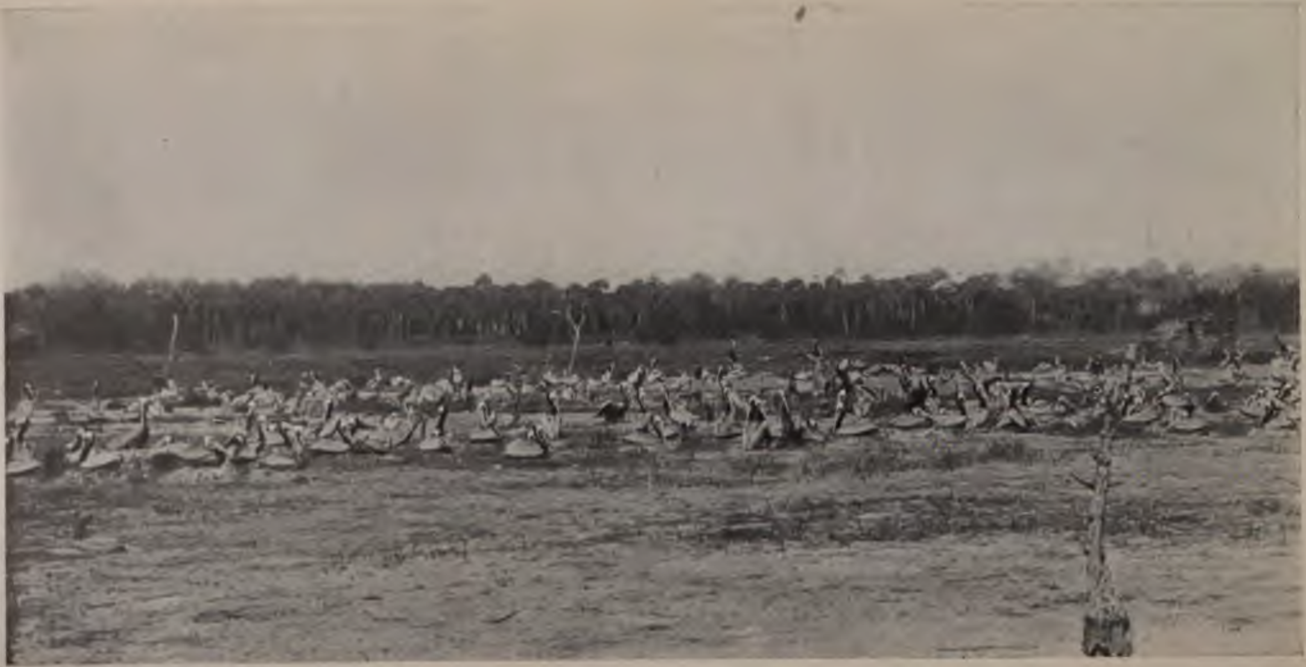
As previously announced (*antea*, p. 150), on December 26, 1909, Mr. and Mrs. C. William Beebe left New York for Europe for the purpose of studying the pheasants, pea-fowl and jungle fowl in Asia and the East Indies. This undertaking, known as the Kuser Asiatic Pheasant Expedition under the auspicies of the New York Zoölogical Society, was initiated and financed by Col. Anthony R. Kuser. The work has now been successfully completed after seventeen months spent in the field. The itinerary covered Ceylon, the Eastern and the Western Himalayas, the plains of India, Burma, Yunnan, the Malay States, Java, Borneo, Eastern and central China, and Japan.

The results of the expedition will be published by the Zoölogical Society in a comprehensive monograph. The success attained may be judged by the fact that of twenty-two genera previously chosen for investigation, every genus was found and studied in the field. Over twenty-five hundred photographs, many eggs and young birds, and large series of adult pheasants were brought back.

Two important generalizations are, first, the rapidity with which many species are being reduced in numbers or actually exterminated, and, second, the many instances of remarkable variation in color and pattern of individual pheasants from a single locality.

THE BILL introduced by Senator Bayne at the present session of the Legislature of the State of New York, absolutely prohibiting the sale of game birds in this State, has passed both houses by very large majorities and has become a law by the signature of the Governor. It had the support of sportsmen's and game protective associations throughout the State, as well of the National Association of Audubon Societies and of the New York State Audubon Society. It will thus not only protect the game birds of this State, but prohibit the sale here of game birds killed in other States, for which New York City has heretofore afforded such a tempting market.

Efforts to repeal the law prohibiting spring shooting of wild fowl on Long Island were fortunately defeated, as was the attempt to repeal the 'Plumage Bill' enacted in 1910.



OLD PELICAN ISLAND, FLORIDA, 1909.
The trees in the background are on the 'Peninsula,' ¼ mile from the Island.

THE AUK:

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NOTES ON PELICAN ISLAND.

BY GEO. NELSON.

Plates IV–VII.

FOR a great many years the Brown Pelicans (*Pelecanus occidentalis*) of the east coast of Florida have occupied as a breeding site, a small island in the Indian River near the town of Sebastian. This island, popularly known as Pelican Island, is not over three acres in area, and only at the sandy ridge at the eastern end is it but little over two feet above the normal water level. Many years ago it was well covered with mangrove trees, in which the birds nested, but now only a few bleached stumps remain. Formerly the nesting season started early in the winter, and was terminated by the following summer, but in recent years, each successive season began a little earlier, and continued somewhat later than the previous one until the years 1908 to 1910 when the island was occupied as a breeding site for twenty-four consecutive months. During the last week in October, 1908, the birds arrived at the island, and the general body of them started building at once. Additional though smaller colonies were continuously arriving until the summer of 1909, and some of the young of these later colonies were still too young to leave when the main body of old birds arrived in October for the new nesting season. The 1909 season continued in much the same manner as the previous one until the third week in October, 1910, when Florida was visited by a violent hurricane; the river rose and completely submerged the island, driving the young to the more elevated islands near by. The reason for this high water may be attributed to the shape and character of the Indian River. For many miles north of Pelican Island the Indian River is a mile or more in width, while a few miles south the width is but a few hundred yards. When the wind is strong from the north for a continued period the water is blown down the shallow river, and, as so great a body of water cannot pass though the "narrows" quickly enough, the river rises for miles above. For more than three weeks after this hurricane Pelican Island was flooded, and it was during this period that the Pelicans arrived for a new nesting season. Their old home having disappeared, they finally began building on one of the larger islands situated about 400 yards southeast of the old island, while about a dozen nests were built on two small islets near by. They were evidently very well satisfied with their new sites, for, although the lowering water soon restored their former island to its normal size, not a single nest was built on it during the entire season.

The new island is peculiarly adapted to the welfare of the Pelicans. It is much larger than the old island, having an area of fully twenty acres, about one half of which is densely wooded with large black mangroves. There are a few small patches of red mangroves near the water. The wooded section is mainly located on the northern and western parts, thereby forming very effectual protection to the majority of birds from the cold "northers." The shape of the island can, with a little imagination, be likened to a pelican at rest, with its head lowered to its shoulders.

Although Brown Pelicans originally preferred arboreal nesting sites, and conditions on the new island seemed favorable for such sites, less than one sixth of the five thousand nests were placed in the trees. This small percentage of tree nests leads us to infer that ground sites are now preferable to arboreal ones. It is so many years since the majority of the birds could have nested in trees, that there can be very few of the present generation that have nested, or were raised in trees; and it is quite probable that those who did so the past season had some previous experience.

On the new island I had many opportunities to contrast the advantages of the terrestrial with the disadvantages of the arboreal nesting sites.

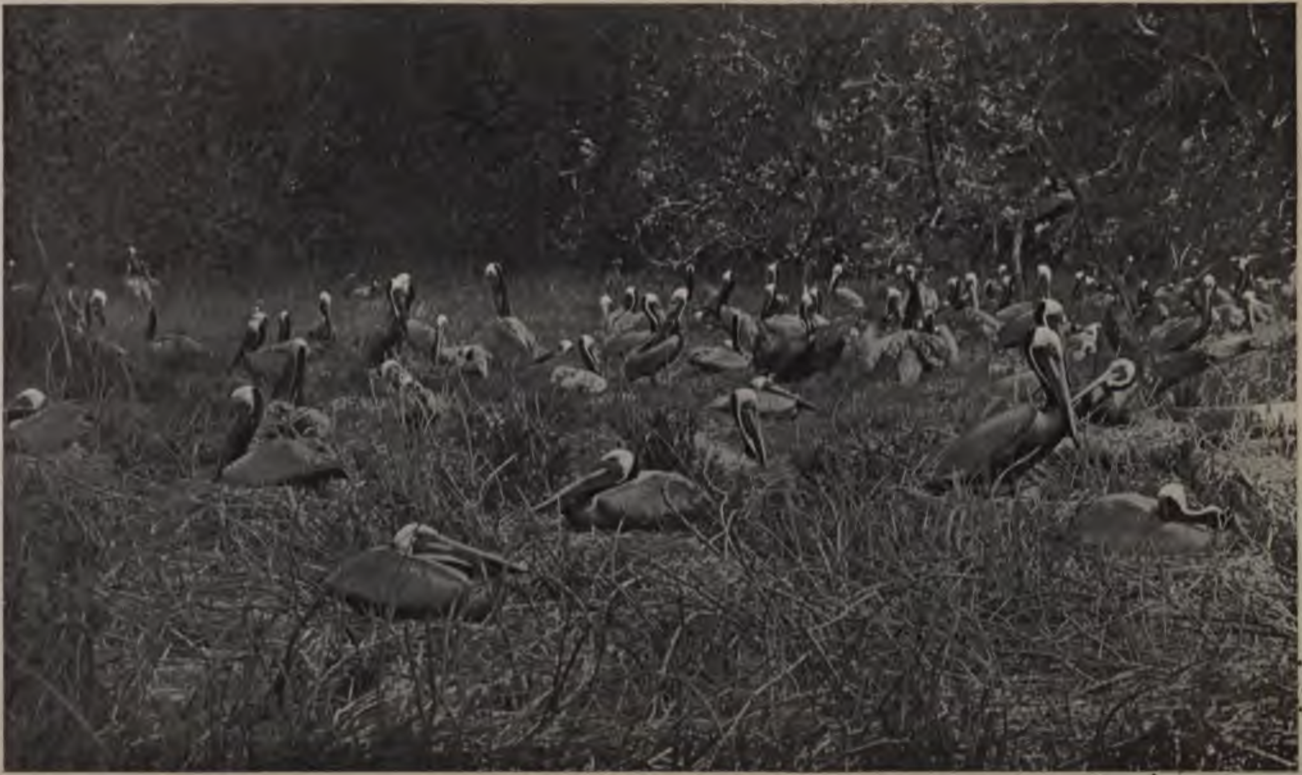
In the arboreal nest, the young pelicans, as soon as they are able to walk with any degree of security, begin to crawl out on the branches, and in many cases are unable to return to the nest to be fed. When the parent birds return to feed their young they land at the nest and pause awhile, then, if their offspring are unable to return, the old birds finally answer their pleadings by flying out and feeding them, but not without considerable difficulty. The outer branches of the mangroves, being very slender and weak, form very insecure perches for such heavy and clumsy birds, and every feeding operation in such places becomes a ludicrous balancing act. The semi-crazed actions of the young pelicans after being fed are undoubtedly the cause of considerable mortality among the young in the taller trees. During these spells they are in great danger of falling to the ground, or they remain in awkward positions among the lower branches. The greatest number of dead young I saw on the island were hanging in these positions, or were on the ground beneath the trees. The cold periods which are becoming more numerous and severe in this section of Florida would be the cause of some mortality among the half grown young, perched on the branches in exposed positions. The ground nesting birds experience none of these difficulties. Here the parent birds can make an easy and graceful landing at any time, and feed their young with greater facility. The young can wander about, thereby getting strength and exercise not possible with tree-nesting birds. No mishap can here befall them while "performing" before and after being fed. They can move to protected places during cold windy weather. The percentage of dead young in the ground nesting localities was not nearly so large as it was among the tree nesters.

The river is very shallow near the new island, and a comfortable landing can be made only on the eastern point. It is on this eastern point where the warden usually lands visitors. Over three hundred persons were landed here during the past season. The birds in the vicinity of this point have been so accustomed to seeing people, that they will allow of very close approach. That all of the birds are not as easily approached as those of the eastern end, became very evident when, on one occasion, the warden and I, wishing to explore the densely wooded interior of the island, landed on the northwestern end. None of the young here that were able to fly would allow of close approach but would usually disgorge three or four fish and thus lightened take to flight. At times we could hear the spattering noise of falling fish before we got to the trees the birds were leaving. All the fish examined proved to be Menhaden (*Brevoortia tyrannus*) about eight inches in length. There is a large treeless space of perhaps two acres, in the centre of the island, so thickly overgrown with "sea parsley" (*Sesuvium*) that it was with some difficulty we made our way over it. Overhead the birds were flying with great speed in large circles. This is the alarm flight of the Pelicans, and can be seen for more than a mile. It is one of the warden's most reliable signs that the pelicans have unwelcome visitors. There were isolated nests in some of the trees in the interior, most of them unoccupied.

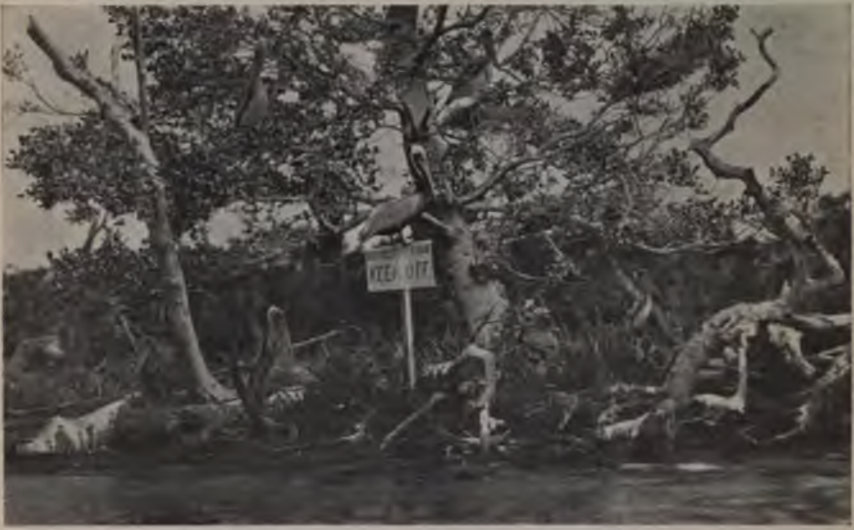
During this trip we flushed a Clapper Rail, a Yellow-crowned Night Heron, and a Yellow-throat (*Geothlypis*). These, with a pair of Great Blue Herons, the Pelicans, and the ever present Buzzards were the only birds we saw in the interior. Almost daily, during March, from fifty to two hundred Florida Cormorants were seen around the island, also large numbers of Lesser Scaup Ducks, a few Little Blue and Louisiana Herons, Fish Hawks and Kingfishers. Should the Pelicans continue in the future to breed on this island, some of the Herons, Egrets and White Ibises will probably colonize with them, as they did many years ago, when there were trees on the old island.

To the nature photographer Pelican Island is peculiarly interesting, for almost any day during the first five months of the year, one can find all possible stages of Pelican life, from nest building to the full grown young bird. The use of a "blind," or place of concealment is neither necessary nor advisable on Pelican Island. In erecting a blind, one of course has to flush the sitting birds, which leave with a great rush, and in many cases, eggs and small young are thrown out of their nests. Then, if the sun is shining, its burning rays would shortly bring about fatal results, as the naked young are naturally seldom wholly exposed to the sun for only a very brief period. I had no trouble in walking very slowly, though with many pauses, to within twenty feet of a colony of birds with newly hatched young. Here I slowly set up

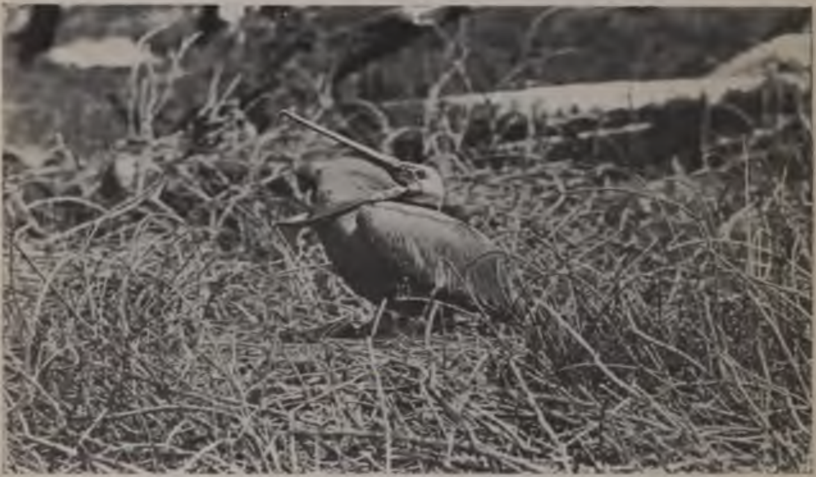
PLATE V.



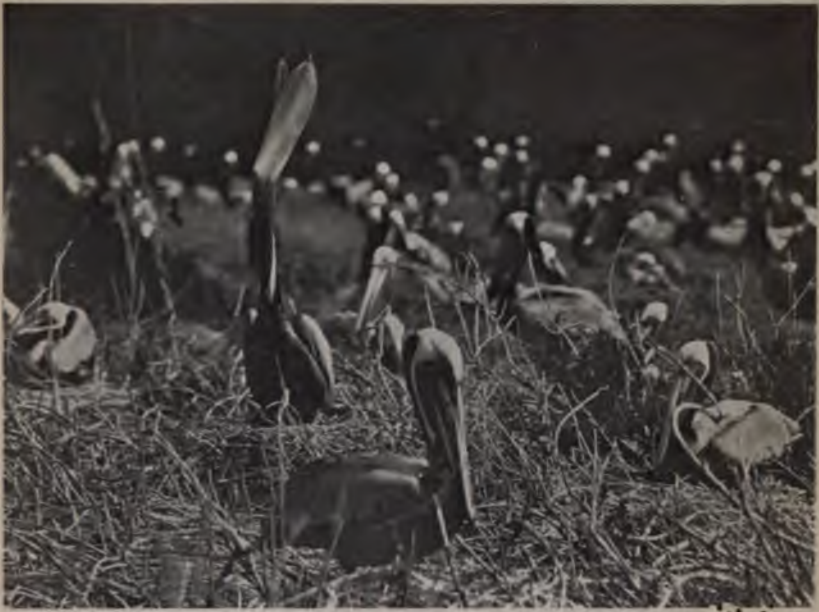
NEW PELICAN ISLAND, FLORIDA, 1911.



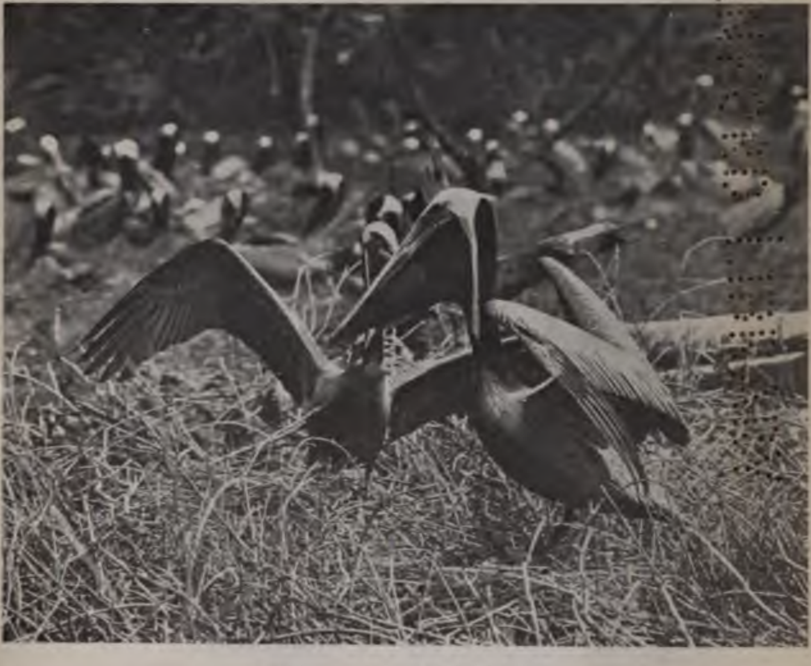
SHORE SCENE ON NEW PELICAN ISLAND.



PELICAN YAWNING.



STRETCHING THE POUCH.



CEREMONY OF NEST-RELIEF.

my camera on a tripod, and by using long-focus lenses, obtained large images of them while they were stretching, sleeping, yawning, and even feeding the small naked young. Photographs of the feeding of the larger young can very easily be obtained by waiting near some of them until the parents arrive. While there is almost always a feeding scene in sight, there are three periods during the day when they are very numerous; in the morning from 7 to 8, and again from 11 to noon, and from 4 to 5 P. M. It is during the 11 A. M. period that the largest number are fed. The island at this time is fairly alive with feeding scenes, the noise of the squawking young being almost deafening.

The 1911 breeding activities were abruptly terminated about the fifteenth of June, by a new and unexpected enemy. Millions of mosquitoes descended upon the birds and so persistently tormented them, that about six hundred nests containing small young were abandoned, and these young, of course, soon perished. This mosquito event may furnish a reason why the Pelicans have become, in the past, so attached to the old island. It being the outermost, and the only barren and exposed one in the vicinity, it consequently receives the full force of every breeze, and must be much less frequented by mosquitoes and other pests than the other islands. Although the season of 1910–1911 came to a close much earlier than that of many previous years, it was one of the most prolific seasons as to the number of young raised to maturity in the history of the colony; the increase being estimated at about six thousand.

Barring a repetition of the conditions which confronted the birds upon their arrival last season, it may be reasonable to suppose that they will return to the old island, but, as there are now too many Pelicans to nest there comfortably, it is very probable that both islands will be abundantly populated. Should this be the case we can be assured of even a more marked increase in the number of Brown Pelicans of the east coast of Florida than that which made the season of 1910–1911 so noteworthy.

THE EXPRESSIONS OF EMOTION IN THE PIGEONS. II. THE MOURNING DOVE (*ZENAIDURA MACROURA* LINN.).

BY WALLACE CRAIG.

INTRODUCTION.

The chief purpose in writing this paper on the Mourning Dove at the present time, is to furnish a basis of comparison for the article which is to follow, on the Passenger Pigeon. For if that remarkable species is extinct, the strange facts regarding its voice and manners ought to be most carefully recorded. The voice and manners of even our most abundant and most familiar birds have been so inadequately studied that we have scarcely a tithe of the complete biography of any one of them; and so the writer feels that the following account of the expressions of emotion in the Mourning Dove is worth while for its own sake. Yet the chief interest in this paper at the present time will come from the light which it helps to throw upon the Passenger Pigeon.

A much more detailed study for comparison is to be found in the first paper of this series[1] on the Blond Ring-Dove, or "Collared Turtle Dove," the species commonly kept in cages; and a still further study in a paper entitled 'The Voices of Pigeons regarded as a means of Social Control' (1908, Craig). The work reported in those papers and in the present two, was done under the guidance of Professor C. O. Whitman, of the University of Chicago, to whom I shall often have occasion to refer as the chief authority on the habits and general biology of the Columbæ. My studies were made in Professor Whitman's large collection of living pigeons, and with his constant direction and advice. I take this opportunity of expressing once more my gratitude to Professor Whitman for his personal interest, his guidance and his counsel, and for the rare privilege of studying in his aviary, stocked with a splendid collection of pigeons from all parts of the world.[2]

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[1] The Expressions of Emotion in Pigeons. I. By Wallace Craig. Journ. Comp. Neurol. and Psychol., Vol. XIX, 1909, pp. 29–80, with 1 plate.

[2] Since these lines were first written, news of the sudden death of Professor Whitman has brought grief to those who knew him personally, and sorrow to all biologists.

A complete account of the expressions of emotion in any bird must contain both a descriptive and a narrative presentation. The present paper accordingly will be divided into two parts, the first descriptive and the second narrative, thus: A. The Forms of Expression; B. The Life-History of Expression.

A. THE FORMS OF EXPRESSION.

General Bearing. The general bearing of a bird, even when it is standing still or slowly walking, may be as specific as its song or its call-note. This is particularly true of the Passenger Pigeon, as we shall show in the next article in some detail, one of these details being the specific way in which the Passenger Pigeon nods its head. Many pigeons nod their heads in a manner characteristic of the species; some species are characterized by the fact that they do not nod at all. The Mourning Dove nods in a way which is similar to that of several of the smaller species: its nod consists of, first, a quick throw of the head obliquely back and up; secondly, as the head comes down again, the tail goes up, up to a very considerable height; lastly, the tail sinks slowly to its normal level and remains so until the next nod. We shall see that the Passenger Pigeon nods in a very different style.

When the Mourning Dove is flying, as is well known, the swish of its wings through the air has a clear, loud, musical tone. So far as I know, this whistling of the wings, unlike the nod just described, is not at all under the control of the bird and is not expressive of any psychic state.

Enmity. I have not had opportunity to observe Mourning Doves fighting. It may be presumed that their fighting is like that of the majority of pigeons. Hence, I shall postpone the discussion of enmity until we take up the Passenger Pigeon, and shall then give a careful account of it.

Fear (Defensive). The expression of fear that is seen in all brooding birds, and also in all young fledglings — the erected feathers, glaring eye, snapping bill, and low hiss — is exhibited by the Mourning Dove with the usual intensity. The details are so familiar to bird-lovers that a description of them in this article is unnecessary.

Alarm (or Fleeing Fear). The expression of fear treated in the preceding paragraph is that of a bird which, for one reason or another, must stay in its place and meet the danger: A bird when fleeing from danger exhibits a very different expression which it is best to distinguish with the separate name, alarm. The expression of alarm, indeed, is quite the opposite of the expression of defensive fear: for in defense the bird makes itself appear as large and terrible as possible; but in alarm it appresses all the feathers, and, stretching out the neck to get a good view of distant danger, appears extremely slender, inoffensive and inconspicuous.

This expression of alarm is found in all pigeons, and in most if not all is accompanied by an *alarm-note.* The alarm cry of the Mourning Dove, like that of the Blond Ring-Dove, is a single, short, emphatic ejaculation, which at once communicates the alarm to all birds within hearing. Another sound which is well understood as an alarm signal is the noisy fluttering of a frightened bird: let one faint-hearted bird beat against the bars of his cage, the noise of his fluttering will spread terror throughout the aviary.

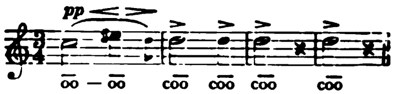
The Kah. The Blond Ring-Dove, as all fanciers of this cage bird know, not only coos but utters vociferously on a great variety of occasions a cry sounding like *kah kah kah kah kah.* This utterance is common to a great many species of pigeons, though in most species it is a single note instead of a repetitional cry. In the Mourning Dove, however, this utterance is greatly reduced; all its variations and applications have disappeared save one, which is the *copulation-note.* The copulation-note is given by both male and female, immediately after coition; in the Mourning Dove it is a faint growling note, repeated two to four times, with rests between. So far as I have seen, the Mourning Doves, throughout the utterance of these sounds, keep the bill wide open; but I know of no other species of pigeons which utters any sound with the bill wide open.

The Charge. The Mourning Dove shares with many other pigeons, including the Blond Ring-Dove, a habit of charging upon other individuals with the head held horizontally forward, the tail pointed horizontally back, and the whole body raised till on the tips of the toes. (Expressions in Pigeons, I, plate, fig. 2). In charging, the bird often gives a great leap, or even a series of leaps, whereas on all other occasions he walks, advancing one foot at a time. The attitude of the charge has become very definite, conventionalized, as it were; perhaps originally the attitude was simply a result of its being the easiest way to cleave the air at full speed, but now it has become a form, a ceremony, and we see the dove assume this position and stalk about slowly, though with scarcely suppressed energy, whenever his aggressiveness is aroused and he is thinking about charging somebody. The Ring Dove, as he charges, utters a loud *kah,* but the Mourning Dove charges silently.

The Coo. (*a*) *The Perch-Coo,* or *Song.* The cooing of the Mourning Dove is of two distinct types, which may be called respectively the perch-coo, or song proper, and the nest-calling coo, or nest-call; the song being sung usually from a perch, whereas the other coo is given typically in the nest or in a place where the birds are making overtures toward nest building. These two types of coo are distinguishable in nearly every species of pigeon; indeed, many species have three or more different coos, but the Mourning Dove has only these two. The song of the Mourning Dove serves functions which, in the Ring-Dove, are divided between the perch-coo and the bowing-coo.

The perch-coo of this species is the well known strain the plaintive sound of which has given to the bird the name of "Mourning" Dove. This strain impresses one as most beautifully melodious, not only when contrasted with bird songs of a far inferior order, but even in the pigeonry where the Zenaidura competes with the gentle cooers of the whole world. Some pigeons have more elaborate songs, but for romantic sweetness there is no pigeon song I ever heard which can approach that of our Mourning Dove. It consists of a series of three (sometimes four) notes on one pitch, preceded by an introductory note which begins below the sustained pitch, glides up above it, and then down to it, thus (No. 1):

No 1. ♩ = 90.

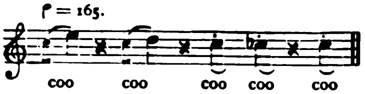


The last note in this score is usually omitted. The mere notation can convey no adequate idea of the exquisite plaintiveness of the strain as rendered by the bird. This song is always given singly, never in a series of repetitions, differing in this respect from the songs of the Ring-Doves and many other species.

When delivering his song, the Mourning Dove does not perform any dance or gesture, as some birds do. He invariably stands still when cooing; even when he coos in the midst of pursuing the female he stops in the chase, stands immovable until the coo is completed, and then runs on. His attitude is, to be sure, very definite, the neck somewhat arched and the whole body rigid; but the impression it gives one is, not that the bird is striking an attitude, but that he is simply holding every muscle tense in the effort of a difficult performance.

The female also utters the perch-coo, though less often than the male, and in a thin, weak voice and staccato tones, which, as compared with the male's song, form so ludicrous a caricature that on first hearing it I burst out laughing. A human burlesquer could not make a more clever travesty. The female's song seems abortive in another way also, in that it is very variable. Four variations of it are represented in the following notations (Nos. 2-5).

No. 2.



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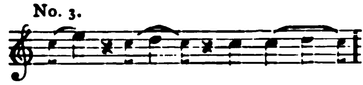

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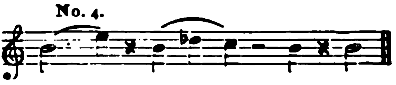
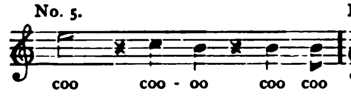
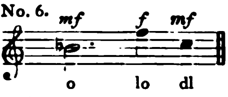


No. 5.

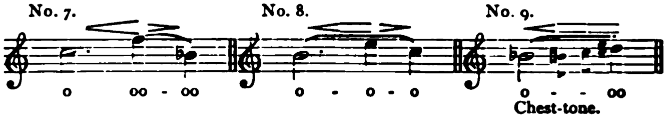


No. 6.



First note hoarse, chest-tone.
Second and third notes clear head-tones.

The Coo. (b) The Nest-Call. The male Mourning Dove, not content with one exquisite lay, sounds also a nest-call which is very different in expression and in its way as perfect as the song. This call is much shorter than the song, and much fainter, so that the field observer may fail ever to hear it. Its typical form is of three notes, a low, a high, and a low, thus somewhat resembling the first bar of the song, but differing in that the three notes do not glide into one another, there being a clear break from each note to the next. The reader will see that this description would fit the Swiss yodel, and in fact the call of the Mourning Dove is in many instances a perfect yodel. However, in some cases the three notes are not thus distinct, two of them or even all three being slurred together. The following musical scores represent the gradations of such slurring, progressively from No. 6 to No. 9. (For No. 6 see p. 402.)



These samples show that the nest-call of the male is much more variable than his song.

The nest-call is given, as said before, usually in the nest, or in some spot which is likely to be chosen as a nesting site. This is true not only of the Mourning Dove but of pigeons in general; and though the sound differs greatly from species to species, the nest-calling attitude is much the same in all, the male sitting with his body tilted forward, tail pointing up at a high angle, the head so low that bill and crop may rest on the floor, or if the bird be in the nest, the head is down in the hollow. Both the voice and the attitude of the male serve to attract the female, for in all pigeons the nest-call is accompanied by a gentle flipping of the wings, ogling eyes, and a seductive turning of the head. In addition to these general columbine gestures, Zenaidura has a special bit of display of his own, for during the first note of the nest-call he spreads his tail just enough to show conspicuously the white marks on the outer feathers; soon as this first note is past, the tail closes and the white marks disappear, to flash out again only with the next repetition of the nest-call, before which there is always a considerable interval.

The nest-call of the female I have not often heard, and I am unable to say how far it differs from that of the male.

B. THE EXPRESSIONAL LIFE-HISTORY.

The preceding pages on the forms of expression have given but little information as to the uses of expression, for these uses can be understood only in connection with the life-history of the species. The life-history can be given here merely in outline; further details can be found in the numerous biographies of the Mourning Dove, in the paper on 'The Voices of Pigeons regarded as a Means of Social Control' (Craig, 1908), and also in the paper on the Blond Ring-Dove (Expressions in Pigeons. I), for the life-histories of the Ring-Dove and Mourning Dove are fundamentally alike.

First, a few remarks on the *development of the young*. The young Mourning Dove even in his squeaking is far more musical than other pigeons; for the begging note of most young pigeons is burred and querulous, but the cry of the young Mourning Dove is a musical sibilant, sliding up the scale, and easily imitated by whistling *sssst*. Gates, in his very interesting paper (1909, p. 11), shows that the young acquires the adult song in a gradual and progressive manner. Nevertheless, the song is not acquired by imitation (Craig, 1908, pp. 89–91); pigeons seem totally devoid of that power of mimicking or mocking which is so wide-spread among the Oscines.

The *breeding habits* of the Mourning Dove as they appear to the ordinary field observer have been described so many times that a repetition of field observations is here unnecessary; I shall treat preferably those details of behavior which can be better observed in the aviary than in the field. As a basis of the narrative I shall tell the story of a pair of captive birds kept in my room, under constant observation, in the summer of 1902.

A pair of Mourning Doves from Professor Whitman's aviary were brought to my room in the month of June. Whether they had reared a brood earlier in the year, I do not know; but in any case the removal to strange quarters naturally interfered with the continuity of their family life, and it was many days before they became amorous again. The male was a little wild, and cooed but seldom. The female was more tame and contented, and it was she who at length caused the bursting forth of the passion that was but smoldering in both their breasts. For on July 2, at 11:17

A. M., she cooed. The song of the female, you remember, is not heard very often, and the effect of this coo upon the male was electrical: he rose majestically to his feet and strutted on tip-toe around the female; then he cooed once, and charged upon her; he chased her all about the cage, stopping three or four times to coo. This charging and driving the female is a regular part of the courting performance. Courtship, having thus recommenced, proceeded daily with singing and charging and some show of anger, for there were Ring-Doves in an adjoining cage which aroused the jealousy of the male.

The nest-call was not heard until July 12. On hearing it, I put in one corner of the cage an artificial nest made of straws in a cigar box. The male dove, however, tried different corners of the cage again and again and again before he finally settled upon the nesting place. Each time that he went to a new corner of the cage he put his head down to see if he could comfortably nest-call there: if he succeeded in getting comfortably into the nest-calling attitude, then he proceeded to nest-call until the female came to him. In one case he called thus for four or five minutes, repeating his refrain forty-five times; then at last the female was aroused and ran excitedly to him. Each time the female thus came to the male in his chosen corner, they both huddled close in that corner caressing one another ecstatically for many minutes together, the male continuing, though at longer intervals, to repeat the nest-call. By this performance, the pair come to an agreement upon a nesting-site, fix the location of it in their memories, and in a true sense consecrate that spot as their home, their temple.

After the nest site, by means of such ceremonies, has been conclusively fixed and dedicated, the female usually remains in the nest to build and fashion it while the male goes off to seek straws and fetch them to her. Each time he returns with a straw there is a little exchange of caresses between the two birds, and either may at this time sound the nest-call. The song or perch-coo also is given during this period of site hunting and nest building, but the song is far less frequent than the nest-call, and of course is not given in the nest. Nest-calling and its accompanying ceremonies continue unabated until the female enters the nest to lay her first egg; then they are dropped rather suddenly, giving place to a new and different order of ceremonies, those connected with incubation.

Throughout the period when the birds are busy dedicating and building the nest, they are busy also with copulation. The sexual act comes only as the culmination of prolonged preliminaries. The caressing and cooing and nest-calling already mentioned all tend to excite the birds; when thus excited, they both show their eros by a certain spasmodic plucking of the inner sides of the wing quills, often referred to briefly as "preening inside the wing"; the female may even beg from the male in very much the same fashion as the young begs from the parent. Finally they bill, the female putting her beak into the mouth of the male and apparently receiving a little food thrown up by him from his crop. After billing, the female squats, the male mounts, copulation is performed, and then the copulation-note as already described (p. 400).

The interval which must elapse between the first copulation and the laying of the first egg, is in the Blond Ring-Dove about 6 days; in the Mourning Dove it may perhaps be a little less. In the case which I am now narrating the female laid her first egg on July 15, some time between 3:45 and 4:30 P. M.; and her second egg July 17, at 7:50 A. M. One egg hatched July 30, early in the morning; the other egg failed to hatch. Male and female take regular daily turns in sitting on the eggs or young: the female sits from evening till morning, the male from morning till evening, the exchanges taking place usually about 8:30 A. M. and 4:30 P. M. This arrangement is very regular if there is nothing to disturb the birds; but if interloping birds come about, this arouses the anger of the male and he leaves the nest in order to attack them.

During the period of incubation and brooding, the doves are comparatively quiet; in fact their whole temperament is fundamentally altered. Either male or female, when on the nest incubating or brooding, is fearfully quiet, always on the lookout for danger, feathers all appressed, body held low and rigidly still. Yet I have known the female when sitting, to sing her feeble song in answer to her mate; and, each time the sitting bird is relieved by its mate, there is an exchange of little marks of affection, such as flipping the wings, preening the head of the mate, and sometimes a quiet, subdued nest-call. When off and away from the nest, either bird is much more free to move about and make a noise; of course they are much more quiet during incubation than in the days of courting; but each evening throughout the incubation period, the male on his roost, which is always some distance from the nest, serenades his sitting mate with the song or the nest-call, repeating one or other of these every few minutes as the day wanes. Zenaidura is a vesper bird; as compared with other doves, he sings less in the morning and relatively more in the evening.

Comparative quiet thus reigns during the whole time of incubating and brooding. But when the young are more or less fledged, the parents begin once again to become wooers. The song and the nest-call are redoubled, and the male begins once again to charge the female and to pluck his wing quills from the inner side. Thus is inaugurated another brood cycle which passes through the regular round of laying, incubating, brooding and rearing the young. These brood cycles continue to follow one another until the latter part of the summer, when the molt approaches; then as the birds finish the task of rearing the last brood they do not warm up to the work of starting another. The merry play of singing, nest-calling, and charging does not reappear until the following spring. It is said that in winter, even the vocal organs of the Mourning Dove dwindle to an insignificant state.

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THE EXPRESSIONS OF EMOTION IN THE PIGEONS.

III. THE PASSENGER PIGEON (*ECTOPISTES MIGRATORIUS* LINN.).

BY WALLACE CRAIG.

INTRODUCTION.

IF the Passenger Pigeon is not yet extinct, it is highly important that there be published an account of its peculiar voice, for this may be of great assistance in re-discovering the birds. Thus, if you tell a boy to look for a bird of the same general appearance as the Mourning Dove but larger, he will be sure to mistake some large-appearing Mourning Dove for the Passenger Pigeon. But tell him to look for a pigeon that shrieks and chatters and clucks instead of cooing, and the boy will be less likely to make a mistake. The voice has this further advantage as a mark of identification, that it cannot be produced in a dead bird, and thus forms an incentive to keep the bird alive.

If the species is extinct, it is equally important to publish whatever is known of its voice, as a matter of permanent record. The Passenger Pigeon is well known to have been a unique species in one respect — its prodigious gregariousness. But the fact is that it was a marked bird in every respect. Ectopistes represents a line of evolution which has diverged widely, in habits at least, from the main paths of Columbine descent. Its voice was more distinctive than that of any other species in Professor Whitman's large collection of living pigeons from all parts of the world. This marked peculiarity of the species makes it infinitely regrettable if the whole race, through sheer wantonness, has been annihilated.

The accounts hitherto published of the voice and mating behavior of the Passenger Pigeon are meagre, largely incorrect, and totally inadequate for that detailed comparative study which scientific considerations demand. The best life-history, so far as concerns the mating behavior, is probably that of Bendire (quoted largely from Wm. Brewster), but even this, as is seen in the very manner of its composition, is fragmentary. Mershon has done a great work in collecting scattered records of the species. But accounts of its voice and gestures are especially scarce. Wilson, for example, makes only this brief statement on the subject: "They have the same cooing notes common to domestic pigeons, but much less of their gesticulations." Even this last brief clause, however, is of value to countervail Audubon's florid description. Audubon has more to say than any other writer on the voice and gestures of the species, but his account is so full of errors that at the end of this paper (p. 423) I shall criticise it in detail. A criticism of the figures on Audubon's plate will follow the discussion of his text, and a criticism of other published figures will be found on pp. 411, 412.

The present study of the expressions of the Passenger Pigeon is also inadequate and, I fear, also incorrect in some details; all that can be said is, that I have made it as truthful and as adequate as I can. I saw this bird in a wild state only once to my knowledge, in Chicago in 1891,[1] as recorded by my late lamented friend Dr. Dunn (Dunn, 1895). My studies of the voice of the species were all made in Professor Whitman's aviary, chiefly in the year 1903, a year which was too late to see much of the vanishing birds, yet too early in my own study for me to have a good grasp of the problems. For Professor Whitman's aviary contained that summer no Passenger Pigeons in full breeding operation, but only a few unmated birds, one male mated with a female of his own species, one mated with a female Mourning Dove, and one mated with a female Ring-Dove, none of these mated birds carrying their breeding operations to completion. And as for a grasp of the problems, suffice it to say that science has not yet reached the point where it can well understand and record the language of any bird. My notes were not published when first taken, because they were felt to be so inadequate; now, after several years further study of doves, I can better understand the facts concerning the Passenger Pigeon, but I have forgotten many details. Hence, the following notes are put forth, not with the assurance that they adequately represent the repertory of this remarkable species, but only with regret that the meagre information now to be given is all we are likely to have on the subject.

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[1] This occurrence of the species has been overlooked by Mershon in his list of occurrences.

A. The Forms of Expression.

General Bearing. As I have said, the Passenger Pigeon had in every respect an individuality which marked it off from the other species of the family, an individuality which stood forth in walking, flying, and every other activity, and even when the bird stood silent and still on the perch. Professor Whitman says, in a published letter (Mershon, p. 199): "Of all the wild pigeons in the world the Passenger Pigeon is my favorite. No other pigeon combines so many fine qualities in form, color, strength and perfection of wing power." And chief Pokagon says (Mershon, p. 49): "It was proverbial with our fathers that if the Great Spirit in His wisdom could have created a more elegant bird in plumage, form, and movement, He never did." The bird was a majestic, muscular, trim body; it consisted of a splendid chest and wings, contrasting with rather short legs and small head, and tapering gradually into the long, slender tail. It was eminently a bird of flight; on the ground, it was rather awkward for a pigeon, its legs seeming too short and its massive shoulders too heavy. In regard to this, as in regard to all other points where practicable, I shall transcribe original notes verbatim.

"All important sounds given on perch or nest, they do nothing on ground but feed, female sometimes making angry noise when quarrelling over food, but I have not known male do even that."

In contrast to this lack of ease on the ground, is the ease and nobility of the Passenger Pigeon when flying and also when perched aloft. When sitting on a perch in the aviary the male often indulged in a grand wing exercise, an impressive display totally different from the fluttering exercise of the other species of pigeon.[1]

"August 1. Male often sits on perch or on ledge and flaps his wings for long time preparatory to flight, looking about him attentively as he does so. For a small part of the time, especially just at the beginning of each series, wings may be held up without being spread, and very slightly flapped; again, they may be fully spread and flapped with the fullest amplitude, the carpi coming within about 1½ inch over the back. The only reason this flapping does not lift the bird is that it is not rapid enough, also the bird seems to hold tightly to perch with its feet. As it is, the whole body, head and tail rise and fall with each stroke. He generally stands obliquely along the perch, so that one wing comes down on each side of perch, but even then it often happens that one wing hits the perch with very audible sound at every stroke."

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[1] I find that I made note of a similar wing exercise once in the Homing Pigeon, and once in the Rock Dove, *Columba livia.*

This wing flapping seems to have been not merely an exercise but also a display, more or less connected with mating, for it was seen chiefly in the breeding season.

The nod of the Passenger Pigeon was utterly different from that of the Mourning Dove. The specific manner of nodding seemed an integral part of the bird's general bearing. The nod consisted of a movement of the head in a circle, back, up, forward, and down, as if the bird were trying to hook its bill over something. Often two or three such nods were given with no pauses between, following one another much more rapidly than in the Mourning Dove, because body and tail remained all the while stationary. Thus the nod, being performed by the head alone, fell in with the general mannerism of the species — the body generally executing strong and ample movements, the short and quick glances and nods being executed by the head alone.

To this general account of the bird's bearing, I may append the following scraps of notes, which, in case the species is really extinct, may prove of interest when our bird biographies become more complete than they are now.

"Ordinary walking pace of male, 12–13 steps in 5 seconds."

"In eating, female pecks at rate of about 12 pecks in 5 seconds on an average, and as head moves through considerable arc, its motion is very quick. The mumbling of each seed, also, is very quick."

"Especially active and noisy in early morning."

The general bearing of this species ought to be shown in the extant drawings of it, but this has been done with varying success. I have seen only five published plates representing the live Passenger Pigeon. Of these, the best to show the form and carriage of the species is the photograph of a young bird, by Professor Whitman (Mershon, facing p. 198). Fuertes's figure of the male (Mershon, frontispiece) is a life-like portrait of this bird in an attitude of alarm or anxious attention; the figure of the female in this same plate is less representative. Wilson's figure (the one reproduced in Coues's 'Key'), though faulty in many particulars, gives one a general impression of strong, massive body, strong wings and shoulders, short legs and small head, all which is truly characteristic. The figures in Baird, Brewer, and Ridgway (Vol. III, p. 369) and in Audubon, as attempts to show the bearing and mannerism of the species, are quite worthless. (A detailed criticism of Audubon's plate is given on p. 425.)

Enmity. The male Ectopistes was a particularly quarrelsome bird, ever ready to threaten or strike with his wings (though perhaps not quite so ready with his beak), and to shout defiance in his loud strident voice. With such a quick temper, such a grand air, and such an unusual voice and method of attack, he generally put to flight a pigeon of any other species at the first onslaught. Nevertheless he was a coward at heart. In short, he was a splendid bluffer.

This is true of all pigeons to a greater or less degree. Most species of pigeon have two methods of fighting: the first, a hostile display or ceremony; the second, actual physical combat. Ceremonial fighting is the most frequent: the contestants make a great show and a great noise, talking and cooing, bowing and strutting, threatening with wings and beak, and generally deciding the quarrel by these means, the less determined party giving in without being hurt. When both sides are determined, however, they pass from this ceremonial fighting into a fierce physical struggle, in which there is no strutting, no ceremony, no crying out, but only the flutter and thud of fighting, and an explosive clapping of angry wings. The pigeon cannot kill his enemy at a blow, as the cock can, for he has no special weapons and his beak is soft, but he can worry his enemy grievously and in time perhaps worry him to death.

Now as to the Passenger Pigeon, he seemed, so far as I knew him, to have but one method of fighting, which was intermediate between the two described. He was an aggressive, violent threatener, but not a real fighter. He would even flee from a Geotrygon, a bird not half his size, as the following extract shows.

"July 25, 1903. A male Passenger Pigeon alighted on ground, was attacked by Geotrygon, chased for several jumps, and finally compelled

> to fly up. Again, a Geotrygon flew down beside a male Passenger on a shelf, and drove him off the shelf simply by going at him with one wing up. A Geotrygon actually drove a male Passenger off his own nest."

The following incident in the life of a male Passenger Pigeon mated with a female Ring-Dove shows that the former was less brave than the latter in driving intruders away from the nest. (In pigeons generally the male is at least as brave as the female in this matter.)

> "July 14, 1903. This morning I found a European Wood Pigeon (*Columba palumbus*) on the nest beside the female Ring-Dove, and a female Passenger in adjacent corner. The male Passenger came in and drove off the interloping female Passenger, then sat in corner quiet. Occasionally he threatened the Wood Pigeon with wings and voice, but dared not go at him. The female Ring-Dove threatened and finally pecked the Wood Pigeon, making him start and throw a wing up. Then the male Passenger flew at him and drove him off."

Had it not been for this comparative harmlessness, the Passenger Pigeons surely could never have nested so close together as they did — a hundred nests in one tree, as both Audubon and Wilson testify. Most pigeons are too aggressive to admit of such neighborliness.

Fear and Alarm. Probably the Passenger Pigeon did not differ greatly from other species in the expressions of fear and alarm, for these are the most uniform expressions throughout the Columbidæ. Chief Pokagon writes as follows (Mershon, p. 50): "While feeding, they always have guards on duty, to give alarm of danger. It is made by the watch-bird as it takes its flight, beating its wings together in quick succession, sounding like the rolling beat of a snare drum. Quick as thought each bird repeats the alarm with a thundering sound, as the flock struggles to rise, leading a stranger to think a young cyclone is then being born." This habit of flying up when the flapping of wings is heard, was taken advantage of by the pigeon-catchers in managing the flock, thus: (Brewster, 1889, quoted in Mershon, p. 75): "After a portion of the flock has descended to the bed, they are started up by 'raising' the stool bird [the stool bird then flapping its wings], and fly back to the perch." The communication of alarm by the sound of wings is seen clearly in all species of pigeon. The Passenger probably had also an alarm-note resembling that of the other species, but of this I have no record.

The Charge. I believe, but am not certain, that the charge, as described for the Ring-Dove and Mourning Dove (Expressions in Pigeons, I, p. 42, and fig. 2; II, p. 400) is not represented in Ectopistes at all. This much is certain, that Ectopistes was more awkward on the ground than are most pigeons, and if it charged or strutted in any manner it did not indulge this habit so much as most pigeons do.

The Kah and the Coo in general. The cries of the Passenger Pigeon which seem to represent the kah and the coo of other species, are identified with those rather by the circumstances under which they are given than by the character of the cry itself, so far have they diverged from the usual type. Some of these cries, the homology of which is uncertain, had better be described under names invented for Ectopistes alone rather than under those names which apply to the Columbidæ in general. The terms used will be the following: 1. The copulation-note; 2. The keck (a name not used for the note of any other species); 3. Scolding, chattering, clucking (these names also peculiar to the species); 4. The vestigial coo or keeho; 5. The nest-call.

The Copulation-note. This note is essentially the same as in the Mourning Dove, and will be described in the course of the life-history (p. 421).

The Keck. This word is an imitation of the cry for which it stands. The first *k*, however, should be aspirated like the German *ch*, to represent the unmusical quality of the cry. The sound is loud, sometimes very loud, harsh, and rather high-pitched (*b* above the treble staff) so far as it can be said to have any pitch at all. It is generally given singly, but sometimes two or more in succession with but short pause between. It is quite unlike any sound I have heard from other species of pigeons. In its use it is, as it were, a loud shout, which commands attention and tends to overpower the bird at which it is directed. It is used both to overpower the female and to overpower an enemy. Hence it would seem to correspond to that expression of the Ring-Dove which I have named the kah-of-excitement (Expressions in Pigeons. I, p. 40). The keck resembles the kah-of-excitement also in that it is often followed immediately by other notes, such as the coo.

"Sometimes with each kheck wings are raised to full extent and flapped once. Often bird is a little oblique on perch so that one wing-tip strikes down in front of perch, the other behind; but sometimes bird is square and both wings come down in front.

"Have seen male give this wing-flap to female without a sound."

"One gave a loud keck and flap of wings at a Turtle-Dove who was bowing-and-cooing on a shelf two feet below him: the Turtle stopped his bowing-and-cooing.

"The Passenger did the same at a Wood Pigeon (*Columba palumbus*)."

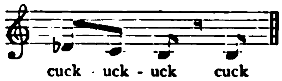
Scolding, Chattering, Clucking. These words are chosen to represent the wide variations of this most characteristic and frequent utterance of the Passenger Pigeon. Similar descriptive words have been used by all who have attempted to treat the voice of this species. Thus Audubon says (Orn. Biog., I, pp. 325, 326): "The common notes resemble the monosyllables *kee-kee-kee-kee.*" Other writers, quoted by Mershon, speak of the sounds as "chattering" (pp. 51 and 166, 167), "twittering" (p. 84), "chirping" (p. 85), "*Tete! Tete! Tete!*" (p. 138), and finally the "crowing call of the wild pigeon" (p. 157). Wm. Brewster (quoted in Bendire, p. 134) says: "They make a sound resembling the croaking of wood-frogs." A vivid idea of the sound may be gained from the following account by H. T. Blodgett (in Mershon, p. 120): "During the spring and also the fall visit, flocks searching for feeding ground could be called down from flight and induced to light on trees near where the call was sounded. The call was one in imitation of the pigeon's own call, given either as a peculiar throat sound (liable to make the throat sore if too often repeated) or with a silk band between two blocks of wood....held between the lips and teeth and blown like a blade of grass between the thumbs. By biting or pressing with the teeth....the tension upon the silk band would be increased, raising the tone of the call or relaxing for a lower note. Cleverly used, it was very successful in calling pigeons feeding in small flocks to alight."

This cry is used in a great diversity of circumstances, it is directed both toward the mate and toward enemies, and in varying situations the utterance varies to an extreme degree. In expressing high excitement it becomes loud and high-pitched, and in the excitement of fighting especially it becomes very rapid. In a gentle mood, it subsides into a soft, low-pitched adagio. Hence, although the tone is never musical the cry is highly expressive, just as the tones of voice in speaking and shouting are expressive. This utterance is probably analogous to the ordinary *kah* of the Ring-Dove, which, you will remember, has no analogue at all in the Mourning Dove.

The following notations (Nos. 1–20) of the scolding, chattering and clucking of the Passenger Pigeon, I made as accurately as I could by ear, in Professor Whitman's aviary.

Alighting on a perch among a lot of other birds.

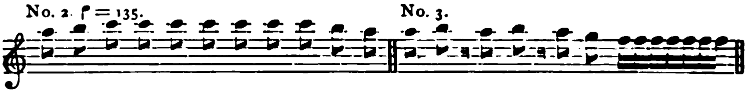
No. 1. ♩ = 120.



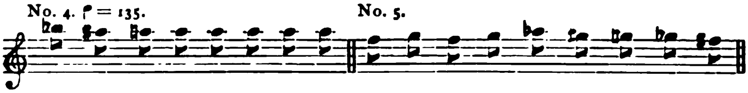
Timbre, a chest-tone, much like the low clucking of a hen. Not loud.

Fighting, Quarreling.

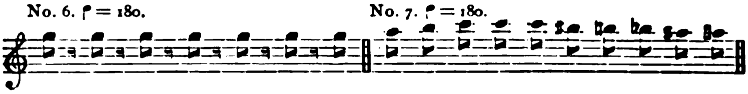
No. 2. ♩ = 135. No. 3.



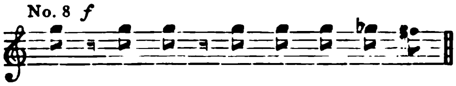
No. 4. ♩ = 135. No. 5.



No. 6. ♩ = 180. No. 7. ♩ = 180.

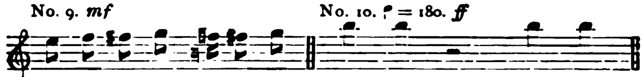


No. 8 *f*



Masterfully, toward female.

No. 9. *mf* No. 10. ♩ = 180. *ff*

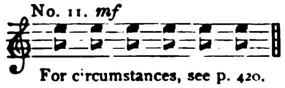


Given with one flap of wings, at a female on perch.

see p. 420.

One flap of wing toward female with each double note.

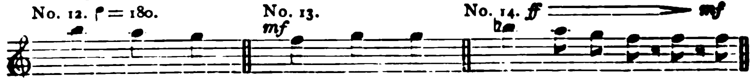
No. 11. *mf*



For circumstances, see p. 420.

Gently, toward mate.

No. 12. ♩ = 180. No. 13. *mf* No. 14. *ff* ——— *mf*

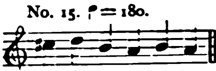


Given by male when just about to tickle female's head.

Given on alighting on nest when female there.

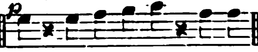
For circumstances, see p. 420.

No. 15. ♩ = 180.



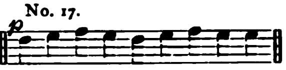
Soft, clucking notes, given in nest just after having brought a straw up to female.

No. 16.



While assisting female in carrying straws to nest.

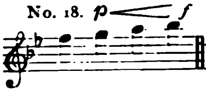
No. 17.



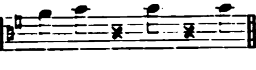
A guttural clucking, on giving straw to female, or on putting it in nest when she is not there.

While carrying straw to nest.

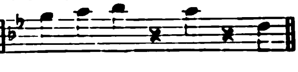
No. 18. *p* < *f*



No. 19.

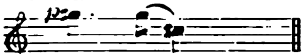


No. 20.



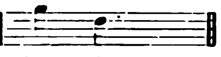
The vestigial Coo, or the "Keeho." The notes which have just been described, were, as said, the most frequent and the most characteristic utterances of the Passenger Pigeon. But not uncommonly when the bird is kecking and clucking he lapses into a weak, somewhat musical strain sounding like *keeho* or some such dissyllable. This is no doubt a vestigial coo. It resembles the coo in sound, and also in the circumstances under which it is uttered, for it is given *after* the more unmusical notes, both in dealing with an enemy and in wooing the female. I call it vestigial, a mere remnant of a coo, for several reasons: its sound is feeble and lacking expression; in function it seems unimportant, coming usually after or among the stronger, more expressive utterances; finally, the manner of its utterance gives the impression that it is somewhat less voluntary, less under the bird's control, than are some other notes of this species or the coos of other species. One sees in this probably an adaptation to life in a community so populous and hence so noisy that cooing could hardly be heard and the pigeon which could best win a female or warn off an interloper would be the pigeon with the merely loudest voice. In this ultra-gregarious species, the soft note, the coo, has degenerated; whereas the hard cry, the kah, has been developed and intensified into the loud sounds of kecking, clucking, chattering and scolding. The following notations (Nos. 21–26) illustrate the vestigial coo.

No. 21.

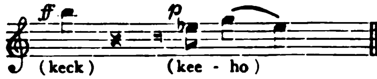


To female in nest, after good deal of low clucking.

No. 22.

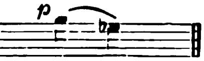


No. 23.



Before giving this, gave keck several times, each time raising wings and closing again suddenly. Once gave a flap of wings forwards.

No. 24.

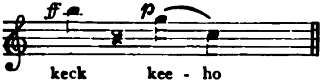


Also given after a few kecks (even if the kecks are at an intruding bird.)

On another occasion, given alone, not preceded by kecks.

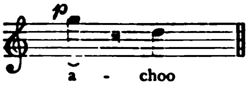
On one occasion, given near nest, after driving other pigeons away.

No. 25.



After a number of loud kecks, each accompanied by a flap of wings.

No. 26. ♩ = 180.

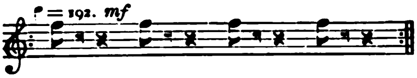


Both clear tones; the first, hard like squeak of violin; the second softer, a head-tone. The slight intermediate ch is toneless.

Altogether, quite musical.

The Nest-call. The nest-call, of which I have only one carefully recorded observation, resembles that of the Ring-Dove and Mourning Dove in the general use to which it is put and in the movements which form part of the expression. The sound is totally unlike that heard from Ring-Dove and Mourning Dove, but bears a general resemblance to the nest-call cooing of the Japanese Turtle (*Turtur orientalis* Lath.) and the European Turtle (*Turtur turtur*), which Professor Whitman believed to be the nearest living representatives of the ancestral type of the whole group.

No. 27.



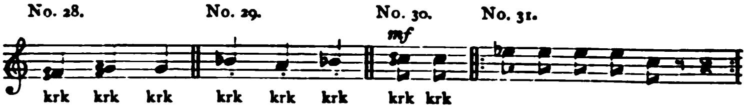
Timbre very much burred — more so than any other note of this species. A great mixture of high and low tones. Only moderately loud, and half musical.

Series consists at the least of about 8 notes, and at the most of a large number. If a long series, it falls a little in pitch, about a semitone. Series always ends with a *keeho.*

Bird stood in nest, with tail up and head down, though not so much tilted as some other species. He was never at rest, always in slight nervous motion.

In much the same position, bird gives a series of *keeho* without the nest-call burred note. With the first note of *keeho* head is raised a good deal above the back, and lowered with second note.

The Voice of the Female. All that has been stated thus far regarding the voice of the Passenger Pigeon, refers to the male only.[1] In this species, as in all other pigeons, the female is comparatively a very quiet bird. The following few notes (notations Nos, 28–31) are all I have on the voice of the female.



No. 28, not loud, a clucking sound. Given on alighting on perch among Band-tailed Pigeons who drove her off.

No. 29, similar to the preceding. Given in striking at a dove and driving it off perch.

No. 30, an almost toneless croak. Uttered at a male whom she wished to drive off. Once heard a male give a very similar note toward a female.

No. 31, an almost toneless croaking sound, like the rolling of an *r* in one's throat. Uttered at another bird in quarrelling over food. Repeated several times. Another day I heard the same utterance given under the same conditions, but 6 notes instead of 5, and a considerable resonant tone with the hoarseness, being *mf*.

Once I heard a female give, at the end of a series of clucks, in the nest, a feeble counterpart of the male's keeho.

B. THE EXPRESSIONAL LIFE-HISTORY.

The life-histories of all pigeons are very much alike; that of the Passenger Pigeon is in general, and even in most of its details, a counterpart of the life-history of the Ring-Dove or the Mourning Dove, as described in the two preceding papers of this series. However, there are many details in the life of Ectopistes which are not found in any other pigeon, and if we had known the species more fully we should probably have found many peculiarities of habit which are now not known at all. I am by no means able to give a complete life-history of the species, but I shall give all my observations on the uses of the various cries and gestures in the mating and general social life of the species.

The wooing of the Passenger Pigeon is very different from that of most other species. There is no bowing as in the Turtles, Ring-Doves, etc., no strutting as in the Domestic Pigeon, and I doubt whether the charge was practised as in the Ring-Doves and Mourning Dove. The male Passenger Pigeon, when displaying near the female, used the *keck*, often accompanied by a single sweep of the wings, also the loud chattering notes and the soft *keeho*, and sometimes the grand wing exercise (p. 410).

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[1] Except musical score No. 1, which I suspect may have been recorded from a female.

"Once when male was caressing female [on a day of copulation] and she flew away from him to next perch, he looked at her, fighting attitude, and gave call No. 10 (p. 416), flapping his wings at her."

When close beside the female, the male Ectopistes had a way all his own of sidling up to her on the perch, pressing hard upon her, sometimes putting his neck over her neck, "hugging" her, as Professor Whitman expressed it.

"July 18. Male presses over on perch against female, gives *keck* twice without raising wings, then preens inside wing [a sign of eros]."

"July 31, 1903. A male is following a female about. Whenever he alights beside her he presses close to her, head held as high as possible and directed toward her. She moves off each time and he sidles along and presses her again and again. This very characteristic of the Passenger Pigeon."

Cry No. 11 (p. 416) was "given to mate, after several kecks and light, swift taps with the wings. The performance looked like fighting, but it was not. The birds sharply and roughly preened each other."

Cry No. 14 (p. 416). "Male alights beside female [on a day of copulation], presses so close as to make her move several steps along the perch, and as he does so gives cry No. 14."

When the female becomes amorous, instead of edging away from the male when he sidles up to her, she reciprocates in the "hugging," pressing upon the male in somewhat the same manner that he presses upon her. These peculiarities make it far more difficult for the breeder to cross the Passenger Pigeon with other species than it is to cross many of these other species *inter se.* Thus, one of Professor Whitman's attempts to mate a female Passenger Pigeon with a male homer (*Columba livia* var.) failed because when the female had been played up to until she was amorous she began to reciprocate by sidling up to the male, wanting to press him and hug him, he took this for just so much pugnacity every time, and edged off, with the result that they never mated. In general the Passenger Pigeons are very rough in their caressing. When a male Passenger is mated with a female Ring-Dove, instead of preening her feathers gently as the male Ring-Dove usually does, he preens her so roughly that she is frightened and edges off from him.

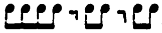
The act of billing, which occurs in all pigeons before copulation, is in Ectopistes reduced to a mere form. In the Ring-Dove, the male opens his mouth, the female puts her bill into it, then follows a pumping movement in which the male seems to be actually feeding the female; then the pair leisurely disconnect, mumble their mouths as if they had a sweet taste in them, and soon bill again in the same careful manner. But in the Passenger the bills are quickly clasped, shaken for a fraction of a second, and as quickly separated; the performance is precisely like a brief, quick handshake. It is probable that there is no passing of food from one mouth to the other. This perfunctory mode of billing, again, causes some difficulty in crossing the species: for example, if a male Passenger is mated with a female Ring-Dove, when they are leading one another up to the point of copulation, the male bills in his abbreviated fashion and immediately wishes to mount, but the female is not yet ready, she is trying again to bill.

With regard to the manner of copulation, I made the following note on July 24, 1903.

> "Each time they copulate, female stands up very straight when male mounts; this compels him to flap his wings for long time, scrambling up near her neck, till she becomes tired [?] and sinks down, then he copulates."

I cannot say whether this procedure is invariably followed, but if so it is peculiar to the species and in keeping with their generally rough manner of wooing. This scrambling of the male on the back of the female is probably a stimulus which serves the same function as the protracted billing in other species.

With regard to the *copulation-note,*

> (July 24, 1903.) "After copulation, male takes a position somewhat like that of fear (fighting), head drawn in and feathers puffed out, and clucks in a soft toneless voice . Female clucks in somewhat similar way, raises wings and strikes male with them two or three times.
>
> "After copulation this evening (7:20 P. M., dusk) both stand up straight and tickle each other's heads with nervous rapidity for several seconds."

In all this, the only act at all peculiar to the species is that of the female striking the male with her wings.

Choosing a nesting-site, carrying twigs and straws to it, and building the nest, are done, as in other pigeons, by male and female in coöperation, with a good deal of ceremony — caressing, cooing, etc. The following contains the gist of my notes on the subject.

> "Female sits in nest and builds it, while male fetches straws to her. He leaves nest and hunts for straws silently, but having found the straw he gives a few kecks on starting, and a few whenever he perches on the way, or when he arrives at nest." Another note reads: "When flying up with a straw he gives a series of notes rising to high pitch and intensity. No. 18 [p. 417] is typical." But in this case he may have been unusually excited, for the pair were in a state of indecision as to which of two nests to use.) On giving straw to female, or putting it in nest when she is not there, he makes a guttural clucking (No. 17, p. 417).
>
> "July 18. Female, in nest with male, gives sound like *kŭ-ss, kŭ-ss, kŭ-ss, kŭ-ss,* in which the first note of each pair is a low cluck, and the second a high squeak."

Ruthven Deane (1896, p. 235), quoting the owner of some captive birds, says: "The females remained on the shelf, and at a given signal which they only uttered for this purpose, the males would select a twig or straw. . . . and fly up to the nest." No doubt the birds do stimulate one another to work, but there is no such definite "signal."

The Passenger Pigeon, like other species, shows intense jealousy throughout the period of wooing and nest-building, quarrelling with any outsider who comes near mate or nest. After the egg is laid, jealousy in regard to the mate ceases, but the jealousy which guards the nest of course continues. Hence, in the old densely populated breeding grounds the noise of quarelling must have been frightful. Brewster, in speaking of the old colonies, says (quoted by Bendire, p. 134): "Pigeons are very noisy when building. . . . Their combined clamor can be heard four or five miles away when the atmospheric conditions are favorable." This condition would seem sufficient to explain the peculiar voice of the species — the emphasizing of loud, piercing tones, and the comparative disuse of the soft notes.

The number of eggs laid by Ectopistes has been the subject of much controversy. Professor Whitman assured me that the female of this species lays only one egg. Morris Gibbs is undoubtedly correct when he says that each female lays but one egg, and that when two eggs or two young are found in the same nest, the two came from different females. In any species of pigeon it might happen that two females should lay in the same nest, but in the Passenger Pigeon this occurrence seems to have been unusually frequent, which is one of several facts going to show an unusual degree of neighborliness in this species.

Another line of evidence going to show an unusual degree of neighborliness in the breeding of this species, is that of the feeding of orphans. Chief Pokagon says (Mershon, pp. 52, 53): "It has been well established that these birds look after and take care of all orphan squabs whose parents have been killed or are missing." E. T. Martin says (Mershon, pp. 102): "In proof of the pigeons feeding squab indiscriminately [this word is surely an exaggeration], I may mention the fact that one of the men in my employ this year.... in one afternoon shot and killed six hen pigeons that came to feed the one squab in the same nest." And Chief Pokagon again (Mershon, p. 206): "I have seen as many as a dozen young ones assemble about a male, and, with drooping wings, utter the plaintive begging notes to be fed, and never saw them misused at such times by either gender." It is true of the domestic pigeon, for example, that a parent may occasionally, if importuned, feed a young one not his own, but it is also true that a young one may be pecked and driven off if it begs from strangers. Hence, if the above-quoted observations on the Passenger Pigeon are correct, they indicate a solicitude for orphans which is probably unique among pigeons.

At the end of the breeding season, the Passenger Pigeon, like other pigeons, becomes a comparatively quiet bird. Beginning early in August, one notices that the birds are not only less amorous but also less quarrelsome: the kecking and scolding and the grand wing exercise become less frequent, less prolonged, and less intense; the *keeho* seems to disappear altogether for a time. But early in the following year, possibly even in January, the flock re-attains its maximum vociferation.

As was said before (p. 409), I purpose now to criticise Audubon's account of the expressions of this bird. Audubon did a great work, a work of foremost value in the history of American ornithology. He was a pioneer — but pioneer work is necessarily rough and imperfect, and some of it must of course be superseded. It would be a mistake, especially in the case of an extinct species, to let incorrect statements stand, no matter how deeply we may venerate their author. I shall quote all that Audubon says (Ornithological Biography, I, pp. 319–326) upon the expressions and mating habits of the species, and shall correct it where known to be wrong. He begins by describing a certain mode of nuptial flight, said to be very similar to such flight in the domestic pigeon; unfortunately, the birds in Professor Whitman's aviary could never be allowed outside and hence had no opportunity to display such flight. After describing the nesting-places, Audubon then proceeds: "At this period the note of the pigeon is a soft *coo-coo-coo-coo*, much shorter than that of the domestic species. [This probably refers to what I have called the *keeho* or vestigial coo.] The common notes resemble the monosyllables *kee-kee-kee-kee*, the first being the loudest, the others gradually diminishing in power. [Not always so inflected. Corresponds to the "scolding," etc., in the present paper.] The male assumes a pompous demeanor and follows the female whether on the ground or on the branches, with spread tail and drooping wings, which it rubs against the part over which it is moving. [?] The body is elevated, the throat swells [? probably this is assumed by analogy from other pigeons], the eyes sparkle.... Like the domestic pigeon and other species, they caress each other by billing, in which action, the bill of the one is introduced transversely [wrong] into that of the other, and both parties alternately [wrong. In no species of pigeon does the female feed the male.] disgorge the contents of their crop by repeated efforts. [Probably there is no disgorging, even by the male, in this species.] These preliminary affairs are soon settled, and the pigeons commence their nests in general peace and harmony. [On the contrary, there must have been ceaseless quarrelling.].... The eggs are two in number. [Undoubtedly wrong.]....During incubation, the male supplies the female with food. [Not true.].... It is a remarkable fact, that each brood generally consists of a male and a female. [Impossible, since there is only one egg.]" The last statement is manifestly carried over from the domestic pigeon, and even of this species it is not so true as is generally supposed, but is an old, old belief, dating back at least to Aristotle. Thus, when we examine Audubon's account of the expressions of the Passenger Pigeon, we find that it came largely by reasoning by analogy from the domestic pigeon and from the author's charming but somewhat unscientific imagination; so much so as to cast a shadow of doubt over other statements which we cannot now verify.

For the sake of our knowledge of this species, Audubon's figures, just as his text, need to be criticised. The plate (Birds of America, Vol. I, pl. lxii, portrays a male and a female Passenger Pigeon in the act of billing, the female sitting on a separate perch, so high above the male that they can just reach one another. But in truth the birds when billing are always side by side; whenever they wish to bill, they sit side by side and caress one another first. The artist evidently intended to represent a female passing food to the male. But this never happens; if any food is passed at all it is from male to female. Coupled with this is the fact that the begging attitude in which Audubon has drawn the male, belongs to the female only among pigeons (and not even to her, I think, in the Passenger). Nor should the tail of the male be spread. As to the bills, the drawing is correct in that it shows the bill of the female inserted into that of the male, but wrong in showing the female's bill inserted "transversely," as the text has it. The fact is, that as the two birds sit side by side in billing, their heads are both in normal position, the upper mandible being uppermost. Thus we see that, however great the value of this plate in other respects, its value as a record of the attitudes and habits of the species, is very little. (Mention of other published figures was made on p. 411).

A word as to the care of Passenger Pigeons, in case we may be so fortunate as to find some still living. Professor Whitman kept his in the same pen with other species, supplied with the pigeon staples of mixed seed, grit, oyster shells, salt, and plenty of green food such as lettuce. After he had had his flock many years, he discovered that they would greedily devour earthworms, and when abundantly supplied with this delicacy the birds improved so much in health and vigor that Professor Whitman thought if only he had known of this diet early enough he might have saved his stock from dying away.

SUMMARY OF PECULIARITIES OF THE SPECIES.

It has been shown in this paper that the Passenger Pigeon was as peculiar in voice and gesture and social life as it was in its habits of flocking and migrating. Even its attitude and movements when standing on a perch, were highly characteristic of the species, seeming to be correlated with its high adaptability for flight. It was comparatively awkward on the ground, and hence was less given to strutting and charging than are other pigeons. On the other hand, it indulged in a grand wing exercise all its own.[1] Its voice was loud and strident, the hard notes being predominant and the musical notes somewhat degenerated, this being probably the result of its living and breeding in colonies so populous that only the loudest sounds could be heard. It was a bluffer in fight, quarrelling much, but having neither much power to hurt the enemy nor much bravery in withstanding his attacks. It suffered intruding pigeons to approach its nest as few other species would do. Its manner of courting was distinctive, characterized by much physical contact and roughness; the gentle ceremony of billing was reduced to a brief, quick contact. All these peculiarities seem to hang together, making a consistent character. And all seem connected, directly or indirectly, with the extreme gregariousness, the breeding in vast colonies.

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[1] But see note added to p. 410.

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OTHER EARLY RECORDS OF THE PASSENGER PIGEON.

BY ALBERT HAZEN WRIGHT.

(*Concluded from page 366.*)

Pennsylvania, New Jersey and Delaware.

In 1634, Capt. Thomas Yong, in his 'Voyage to Virginia and Delaware Bay and River,' found[1] "infinite number of wild pidgeons" in the latter region. Some fifty years later (1683), 'A Letter from William Penn,' etc., in speaking "Of the fowl of the land," gives[2] "pigeons" as "in abundance." The same year, February 10, 1683, another letter from Pennsylvania by Thomas Paskel observes that[3] "There are here very great quantities of birds and one hardly thinks it worth while to shoot at ring pigeons...." 'A Collection of Various Pieces concerning Pennsylvania,' printed in 1684, finds[4] "The woods are supplied with a quantity of wild birds, as....pigeons,...."

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[1] Mass. Hist. Soc. Coll., Fourth Series, IX, 1871, p. 130.

[2] Proud, Robert. The History of Pennsylvania, etc., Vol. I, 1797, p. 250.

[3] Penn. Mag. of Hist. and Biog., Vol. VI, p. 326.

[4] *Ibid.*, p. 313.

Two years later (September 13, 1686, Green Spring), 'A Letter from Doctor Moore Relating to the State and Improvement of the Province of Pennsylvania' yields this note of interest:[1] "We have had so great abundance of *Pigeons* this Summer, that we have fed all our Servants with them." About this same time, Pastorius found[2] "pigions" in "great abundance" in Pennsylvania. Several years later (1702), Holm, in speaking of birds and fowls in New Sweden, notes[3] both "turtle-doves" and "pigeons."

In verse we have two notes the first by Thomas Makin in 1729:[4]

> "Here, in the fall, large flocks of pigeons fly,
> So numerous, that they darken all the sky."

The other is undated and comes from John Holme.[5]

> "The pidgeons in such numbers we see fly
> That like a cloud they do make dark the sky;
> And in such multitudes are sometimes found,
> As that they cover both trees and ground:
> He that advances near with one good shot
> May kill enough to fill both spit and pot."

In 1741 Oldmixon merely mentions[6] pigeons as among the fowl of Pennsylvania. In 1765 we reach our first extended statement when Samuel Smith says:[7] "The wild pigeons, at three or four seasons in the year, commonly pay a visit (except in seed time) generally acceptable: They have not been observed of late years so plenty as formerly; they then, sometimes, to avoid the north-east storms, flew night and day, and thick enough to darken the air, and break trees where they settled, and were more tame and more wanted; all which made them an article of consequence to the early inhabitants: The Indians, before the European settlements, used every year regularly to burn the woods, the better to kill deer;.... this practice kept the woods clean, so that the pigeons readily got acorns, which then not being devoured by hogs, were plenty almost everywhere, and induced a return more frequently than now: They breed chiefly to the northward."

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[1] Penn. Mag. of Hist. and Biog., Vol. IV, p. 449.

[2] Memoirs Hist. Soc. Penn., Vol. IV, 1840, 91. (Part II.)

[3] Mem. Hist. Soc. Penn., Vol. III, p. 41. (Part I.)

[4] Proud, Robert. The Hist. of Pennsylvania, etc., Vol. II, 1798, p. 367.

[5] Bull. Hist. Soc. Penn., Vol. I, 1845–47, p. 165.

[6] Oldmixon, John. *Vide supra*, Vol. I, p. 306.

[7] Smith, Samuel. The History of the Colony of Nova-Caesaria or New Jersey. Burlington, N. J., 1765. 2nd edit., 1877, p. 511.

Of this species in Pennsylvania, William Bartram, in 1791, writes as follows:[1] "These arrive in Pennsylvania in the autumn, from the North, where they continue during the winter, and return again the spring following, I suppose to breed and rear their young; and these kinds continue their journies as far South as Carolina and Florida. In 1807 (July 31) at Presque Isle, Schultz records[2] the "pigeon." In 1819, C. B. Johnson reports that[3] "Wild pigeons commonly visit this place in the spring and autumn; when their numbers are truly astonishing. Flocks of them are sometimes seen, so large as to contain millions; their flesh is dark, and, when fat, very good." Lastly, at Allentown, Pa., about Sept. 10, 1832, Maximilian, Prince of Wied, says,[4] "the wild pigeons passed by in large flocks.

Virginia and Maryland.

In Virginia and Maryland we naturally would expect several early records of the pigeon, for many of the earlier scribes gave most of their attention to the colonies about the Potomac.

The first record by William Strachey (1610?-1612?) is interesting partly from its quaintness:[5] "A kind of wood-pidgeon we see in the winter time, and of them such nombers, as I should drawe from our homelings here (such who have seene, peradventure, scarce one more then in the markett) the creditt of my relation concerning all the other in question, if I should expresse what extended flocks, and how manie thousands in one flock, I have seene in one daie, wondering (I must confesse) at their flight, when, like so many thickned cloudes, they (having fed to the norward in the daye tyme) retourne againe more sowardly towards night to their roust; but there be manie hundred witnesses, who maie convince this my report, if herein it testifieth an untruth."

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[1] Bartram, William. Travels through North and South Carolina, Georgia, East and West Florida, etc. Philadelphia, 1791, Part II, p. 289.

[2] Schultz, Christian. Travels, etc., 2 vols., N. Y., 1810, Vol. I, p. 47.

[3] Johnson, C. B. Letters from the British Settlements in Pennsylvania. Philadelphia and London, 1819, p. 55.

[4] Early Western Travels, Vol. XXIII, p. 127.

[5] Strachey, Wm. Historie of Travale into Virginia. Hakluyt Soc., London, 1849, p. 126.

In 1612, Capt. John Smith writes:[1] "In winter there are plenty of Swans,.... Pigeons." 'A Relation of Maryland,' 1635 practically repeats[2] the same observation. The next year (after Smith), 1613, Whittaker at Henrico writes to the same effect:[3] "In winter our fields be full of Cranes,.... Pigeons,...." Two years afterwards Ralph Hamor found[4] "*wilde Pigeons* (in winter beyond number or imagination, my selfe have seene three or foure houres together flockes in the aire, so thicke that even they have shaddowed the skie from us)...." In 1624, Thomas Hariot, in his Historical Narrative, mentions[5] "Stockdoves," among the birds of the region. In 1650 Edward Williams (2nd edit. London, 1650) speaks very encouragingly of Virginia as follows:[6] "That no part of this happy Country may be ungratefull to the Industrious, The ayre it selfe is often clouded with flights of Pigeons...." Some twenty years later, Lederer found in his "several marches from Virginia to the West of Carolina," etc.[7], "great variety of excellent Fowl, as .... Pigeons...."

Soon after we discover a note where we would least expect it. This writer, with Dudley of Massachusetts, conceives of the flights of pigeons as portents. In 'The Beginning, Progress, and Conclusion of Bacons Rebellion in Virginia, in the years 1675 and 1676," he writes:[8] "About the year 1675, appear'd three prodigies in that country, which from th' attending disasters, were look'd upon as ominous presages. The one was a large comet.... Another was, fflights of pigeons in breadth nigh a quarter of the midhemisphere, and of their length was no visible end; whose weights brake down the limbs of large trees whereon these rested at nights, of which the ffowlers shot abundance and eat 'em; this sight put the old planters under the more portentous apprehensions, because the like was seen (as they said) in the year 1640 when th' Indians committed the last massacre, but not after, untill that present year 1675."

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[1] Smith, Capt. John, etc., Works of, 1608–1631. Edited by Edward Arber, 1884, p. 60.

[2] Narratives of Early Maryland. New York, 1910, p. 80.

[3] Hakluytus Posthumus or Purchas His Pilgrimes. By Samuel Purchas. Glasgow, 1905–1907. Extra Series Hakluyt Soc., Vol. XIX, 1906, p. 155.

[4] Hamor, Ralph. A True Discourse of the Present Estate of Virginia, etc., till the 18 of June 1614, etc. London, 1615. Richmond 1860, p. 21.

[5] Sir Walter Ralegh and his Colony in America. Prince Soc. Pub., Vol. XV, 1884, p. 218.

[6] Force, Peter. Tracts and Other Papers, etc. Vol. III, 1844, p. 12.

[7] Lederer, John. The Discoveries of, etc. By Sir William Talbot. London, 1672, p. 25.

[8] Force, Peter. *Ibid.*, Vol. I, p. 7.

Much later, Philip Bruce, in 'Social Life of Virginia in the Seventeenth Century' (Richmond, 1907, pp. 167, 213), writes as follows: "The clouds of wild pigeons arriving at certain seasons in incredible numbers, were killed by the tens of thousands, and for many weeks furnished an additional dish for the planter's table.... The destruction of the turkey and partridge did not approach that of the wild pigeon, a bird which arrived in Virginia at the same season annually in the course of its migration. All contemporary observers declare that the number of these birds appearing at these times was far beyond the power of human calculation; that for hours they darkened the sky like a pall of thunder clouds; and that they broke down, by their weight, the limbs of the forest wherever an entire flock lighted in search of food. It can be well imagined that the return of this vast multitude of birds was eagerly anticipated each year by every Virginian who was fond of the sport of shooting and capturing them. So thickly did they crowd the woods in different places, and so tame had they become from fatigue and hunger, that they were struck down in great numbers with poles reaching up to their perches; nor was the work of destruction confined to the day; thousands were killed in the same manner at night, when the glare of torches served to confuse and bewilder their eye-sight."

In 1722, Robert Beverly does not notice[1] the pigeon beyond a mere mention on two places. Six years later we come to William Byrd whose 'History of the Dividing Line Betwixt Virginia and North Carolina, 1728' (Petersburg, Va., 1841, p. 57) teems with natural history notes of real merit. Of a flight of pigeons, October 19, 1728, he speaks thus: "The men's mouths watered at the sight of a prodiguous flight of wild pigeons, which flew high over our heads to the southward. The flocks of these birds of passage are so amazingly great, sometimes, that they darken the sky; nor is it uncommon for them to light in such numbers in the larger limbs of mulberry trees and oaks as to break them down. In their travels they make vast havoc amongst the acorns and berries of all sorts, that they waste whole forests in a short time, and leave a famine behind them for most other creatures; and under some trees where they light, it is no strange thing to find the ground covered three inches thick with their dung. These wild pigeons commonly breed in the uninhabited parts of Canada, and as the cold approaches assemble their armies and bend their course southerly, shifting their quarters, like many of the winged kind, according to the season. But the most remarkable thing in their flight, as we are told, is that they never have been observed to return to the northern countries the same way they came from thence, but take quite another route, I suppose for their better subsistence. In these long flights they are very lean, and their flesh is far from being white or tender, though good enough upon the march, when hunger is the sauce, and makes it go down better than truffles and morels would do."

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[1] History of Virginia. London, 2nd edit., 1722, pp. 135, 275.

In 1739 (March 21), John Clayton of Gloucester Co., Va., in a letter writing of 'Virginia Game and Field Sports,' enumerates the best fowls, including[1] "wild Pidgeons in prodigious great flocks,...." Two years later Oldmixon says[2] "There's great Variety of wild Fowl, as.... Pigeons; "In 1763, Col. James Gordon of Lancaster Co., Va., made these entries in his journal:[3] "Jan. 18, 1763. Vast quantities of wild pigeons about; our people killed 60 or 70 of them. Jan. 20 Went out with....who killed many wild pigeons." In 'A Topographical Description of the County of Prince George in Virginia,' 1793, John Jones Spooner states:[4] "The woods afford....pigeons,...." Thomas Jefferson in his 'Notes on the State of Virginia,' 1825 (written in 1781) gives (p. 99) the Pigeon as a Virginian bird noting only its common and scientific names. In Maryland, Ducatel, in speaking of South Mountain, valley of Middletown), says that[5] "at certain seasons of the year the trees are literally covered with flocks of wild pigeons (*Columba migratoria*)."

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[1] Virginia Magazine, Vol. VII, Oct. 1899, No. 2, p. 173.

[2] Oldmixon, *vide supra*, Vol. I, p. 445.

[3] Williams and Mary Quarterly Hist. Mag., Vol. XII, July 1903, No. 1, p. 1.

[4] Mass. Hist. Soc. Coll., Vol. III, 1794 (reprint, 1810), p. 86.

[5] Trans. Maryland Acad. of Sci. and Lit., Vol. I, Baltimore, 1837, p. 40.

In 1842, J. S. Buckingham writes at considerable length about this bird. He quoted Wilson's, Catesby's and Hinton's accounts, the first two of which are well known biologic sources and are therefore omitted. The last we retain because not so widely quoted. At Virginia Springs, August, Buckingham found[1] "The wood-pigeon was also more numerous than we had before observed it; and we were told, that sometimes their numbers here exceeded all belief."

"Hinton's account of these birds is as striking and as accurate as either of the preceding. 'The most remarkable characteristic of these birds is their associating together, both in their migrations, and during the period of incubation, in such prodigious numbers, as almost to surpass belief, and certainly to have no parallel among any other of the feathered tribes on the face of the earth, with which naturalists are acquainted. Their roosting-places are always in the woods, and sometimes occupy a large extent of forest. When they have frequented one of these places for some time, the ground is covered several inches deep with their dung; all the tender grass and underwood destroyed; the surface is covered with large limbs of trees, broken down by the weight of the birds clustering one above another; and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of this desolation remain for many years on the spot; and numerous places can be pointed out, where, for several years afterwards, scarcely a single vegetable made its appearance. When these roosts are first discovered, the inhabitants from considerable distances visit them in the night with guns, clubs, long poles, pots of sulphur, and various of other engines of destruction; and in a few hours they fill many sacks, and load their horses with the birds. The breeding-places are of greater extent than the roosts. In the western countries they are generally in beech-woods, and often extend, nearly in a straight line across the country, a great way. Not far from Shelbyville, in the state of Kentucky — once included within the boundary of Virginia — a few years ago, there was one of these breeding-places, which was several miles in breadth, and upwards of forty miles in length. In this tract, almost every tree was furnished with nests, wherever the branches could accomodate them. The pigeons made their first appearance there about the 10th of April, and left it altogether, with their young, before the 25th of May. As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants, from all parts of the adjacent country, came with waggons, axes, beds, cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery.'"

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[1] Buckingham, J. S. The Slave States of America, 2 vols., London and Paris, 1842, Vol. II, pp. 330–332.

The Carolinas.

In the Carolinas we have a few brief notes and two extended accounts, the latter by Lawson and Wm. Bartram, who were certainly two of the best of the earlier observers.

In 1682 occur two notes by Ashe and Wilson. The first gives [1] the "Pigeons" as among the "Birds for Food, and pleasure of Game," while the second says, [1] "Here are also in the woods, great plenty of.... Turtle Doves,.... Piggeons."

In 1714, John Lawson's famous 'History of Carolina' appeared. First, in his 'Journal of a thousand Miles of Travel among the Indians from South to North Carolina,' when near Sapona, he encountered a flight of pigeons about which he remarks as follows: [2] "In the mean time, we went to shoot pigeons which were so numerous in these parts that you might see many millions in a flock; they sometimes split off the limbs of stout oaks and other trees upon which they roost of nights. You may find several Indian towns of not above seventeen houses, that have more than one hundred gallons of pigeon's oil or fat; they using it with pulse or bread as we do butter, and making the ground as white as a sheet with their dung. The Indians take a light and go among them in the night and bring away some thousands, killing them with long poles, as they roost in the trees. At this time of the year, the flocks as they pass by, in great measure, obstruct the light of the day." He gives it also in his list of birds.

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[1] Historical Collections of South Carolina. By B. R. Carroll. New York, 1836, Vol. II, pp. 73, 28.

[2] Lawson, John. The History of Carolina, etc. London, 1714. Reprinted Raleigh, 1860, pp. 78–79, 222, 231–233.

Closely following the above list comes a very interesting discussion of this form. "Our wild pigeons are like the wood queese or stock doves, only have a longer tail. They leave us in the summer. This sort of pigeon (as I said before) is the most like our stock doves or wood pigeons that we have in England; only these differ in their tails which are very long, much like a parrakeeto's. You must understand that these birds do not breed amongst us, (who are settled at and near the mouths of the rivers, as I have intimated to you before) but come down (especially in hard winters) amongst the inhabitants in great flocks, as they were seen to do in the year 1707, which was the hardest winter that ever was known since Carolina has been seated by the Christians.... Although the flocks are, in such extremities, very numerous; yet they are not to be mentioned in comparison with the great and infinite numbers of these fowl that are met withal about a hundred or a hundred and fifty miles to the westward of the places where we at present live; and where pigeons come down in quest of a small sort of acorns, which in those parts are plentifully found. They are the same we call turkey acorns, because the wild turkies feed very much thereon; and for the same reason those trees that bear them are called turkey oaks. I saw such prodigious flocks of these pigeons in January and February, 1701-2, (which were in the hilly country between the great nation of the Esaw Indians and the pleasant stream of Sapona, which is the west branch of Clarendon or the Cape Fair river) that they had broke down the limbs of a great many large trees all over those woods whereon they chanced to sit and roost, especially the great pines, which are a more brittle wood than our sorts of oak are. These pigeons, about sunrise, when we were preparing to march on our journey, would fly by us in such vast flocks that they would be near a quarter of an hour before they were all passed by; and as soon as that flock was gone another would come, and so successfully one after another for the great part of the morning. It is observable that wherever these fowl come in such numbers, as I saw them then, they clear all before them, scarce leaving one acorn upon the ground, which would, doubtless, be a great prejudice to the planters that should seat there, because their swine would be thereby deprived of their mast. When I saw such flocks of the pigeons I now speak of, none of our company had any other of shot than that which is cast in moulds, and was so very large that we could not put above ten or a dozen of them into our largest pices; wherefore we made but an indifferent hand of shooting them; although we commonly killed a pigeon for every shot. They were very fat and as good pigeons as ever I eat. I enquired of the Indians that dwelled in those parts, where it was that those pigeons bred, and they pointed toward the vast ridge of mountains and said they bred there. Now, whether they make their nests in the holes in the rocks of those mountains or build in trees, I could not learn; but they seem to me to be a wood pigeon that build in trees, because of their frequent sitting thereon, and their roosting on trees always at night, under which their dung commonly lies half a foot thick, and kills everything that grows where it falls."

In 1761 and 1770 we have the following notes: the first, in 'A Description of South Carolina,' etc., gives [1] "the sorts of wild fowl that frequent the inland parts of the Country," as ".... Pidgeons, ...;" the second, "A Short Description of the Province of South Carolina: Written in the year 1763 by G. Milligen. London, 1770," states that [1] "In the woods and fields are plenty of wild turkeys...., doves, pigeons,...." Shortly after, Alex. Hewatt, in 'An Historical Account of .... South Carolina and Georgia' (London, 1779, Vol. I, p. 85), records "wild turkeys, pigeons,...., and turtle doves, in great numbers...."

Near the close of the eighteenth century William Bartram visited this region and in his 'Travels through North and South Carolina, Georgia, East and West Florida,' (Philadelphia, 1791, Part IV, Chap. X, pp. 469, 470), gives the following account: "Left Savannah in the evening, in consequence of a pressing invitation from the honourable Jonathan Bryan, Esq. who was returning from the capital, to his villa, about eight miles up Savanna river; .... At night, soon after our arrival, several of his servants came home with horse loads of wild pigeons (Columba migratoria) which it seems they had collected in a short space of time at a neighboring Bay swamp; they take them by torch light; they have particular roosting places, where they associate in incredible multitudes at evening, on low trees and bushes, in hommocks or higher knolls in the interior parts of vast swamps. Many people go out together on this kind of sport, when dark; some take with them little fascines of fat Pine splinters for torches; others sacks or bags; and other furnish themselves with poles or staves; thus accoutered and prepared, they approach their roosts, the sudden blaze of light confounds, blinds and affrights the birds, whereby multitudes drop off the limbs to the ground, and others are beaten off with their staves, which by the sudden consternation, are entirely helpless, and easily taken and put into the sacks. It is chiefly the sweet small acorns of the Quercus phillos, Quercus aquatica, Quercus sempervirens, Quercus flammula, and others, which induced these birds to migrate in the autumn to those Southern regions; where they spend their days agreeably, and feast luxuriously, during the rigour of the colds in the North, whither they return at the approach of summer to breed."

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[1] Hist. Coll. S. C. By B. R. Carroll. N. Y., 1836, Vol. 2, pp. 250, 482.

At the close of the century John Davis, in a 'Journey from Charleston to Coosahatchie,' remarks:[1] "Sometimes we fired in vollies at the flocks of doves that frequent the corn fields;...." Finally, in 1809, David Ramsay gives[2] "the pigeon" as one of the "birds of passage," in South Carolina.

The Gulf States.

In this region the pigeon record begins early. In Florida, as early as 1567, Rene Laudonniere and his associates "fortified and inhabited there two Summers and one whole Winter." Of this period they say:[3] "In the meane while there came unto our fort a flocke of stocke-doves in so great number, and that for the space of seven weeks together, that every day wee killed with harquebush shot two hundred in the woods about our fort." In a description of Florida, 1587, this same captain enumerates[1] "Pigions, Ringdoves, Turtles,...." At the close of the sixteenth century Daniel Coxe, in discussing the resources of the country, writes:[2] "I had almost forgotten to communicate two commodities, one for the health, the other for the defence of our bodies.... The latter is salt petre, which may probably be here procured cheap and plentifully, there being at certain seasons of the year most prodigious flights of pigeons, I have been assured by some who have seen them, above a league long, and half as broad. These come, many flocks successively, much the same course, roost upon trees in such number that they often break the boughs and leave prodigious heaps of dung behind them; from which, with good management and very little expense, great quantities of the best saltpetre may be extracted." In "Virginia richly valued, By the description of the mainland of Florida, her next neighbor", etc. (London, 1609),[3] "Pigeons" find a place. About a century and a half later, 1753, a writer notes that[4] "Along the coast of New Billoxi, one finds turtle doves. There is also in this country all kinds of birds of passage: there are in winter....wood pigeon...." Five years later, in 1758, 'The History of Louisiana,' by M. LePage Du Pratz, appeared in which the author recounts some of his experiences with this species.[5] "The Wood-Pigeons are seen in such prodigious numbers, that I do not fear to exaggerate, when I affirm that they sometimes cloud the sun. One day on the banks of the Mississippi I met with a flock of them so large, that before they all passed, I had leisure to fire with the small piece four times at them. But the rapidity of their flight was so great, that though I do not fire ill, with my four shots I brought down but two. These birds come to Louisiana only in the winter, and remain in

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[1] Davis, John. Travels of Four Years and a Half in the United States of America during 1798, 1799, 1800, 1801, and 1802. London, 1803. New York edition, 1909, by A. J. Morrison, p. 91.

[2] Ramsay, David. The History of South Carolina, etc. Charleston, 1809, Vol. II, p. 333, 334.

[3] Hakluyt, Richard. The Principal Navigations Voyages Traffiques and Discoveries of the English Nation. Glasgow edit., 1903–1905. Hakluyt Society, Extra Series, Vol. IX, p. 53.

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[1] Hakluyt Society, Extra Series, Vol. VIII, p. 451.

[2] Coxe, Daniel. A Description of the English Province of Carolana, By the Spaniards called Florida, and by the French La Louisane, etc., In Hist. Coll. Louisiana, By B. F. French. Part II, Philadelphia, 1850, p. 270.

[3] Force, Peter. *Ibid.*, Vol. IV, 1846, p. 132.

[4] Memoires Historiques sur la Louisiane. Paris, Tome Premier, 1753, p. 91.

[5] Du Pratz, M. Le Page. The History of Louisiana. London edit., 1774, pp. 278–280, 283, 196.

Canada during the summer, where they devour the corn, as they eat acorns in Louisiana. The Canadians have used every art to hinder them from doing so much mischief, but without success. But if the inhabitants of those colonies were to go a fowling for those birds in the manner that I have done, they would insensibly destroy them. When they walk among the high forest trees, they ought to remark under what trees the largest quantity of dung is to be seen. Those trees being once discovered, the hunters ought to go out when it begins to grow dark, and carry with them a quantity of brimstone which they must set fire to in so many earthen plates placed at regular distances under the trees. In a very short time they will hear a shower of wood-pigeons falling to the ground, which, by the light of some dried canes, they may gather into sacks, as soon as the brimstone is extinguished. I shall hear give an instance that proves not only the prodigious number of those birds, but also their singular instinct. In one of my journeys at land, when I happened to be upon the bank of the river, I heard a confused noise which seemed to come along the river from considerable distance below us. As the sound continued uniformly I embarked, as fast as I could, on board the pettyaugre, with four other men, and steered down the river, keeping in the middle, that I might go to any side that best suited me. But how great was my surprise when I approached the place from whence the noise came, and observed it to proceed from a thick short pillar on the bank of the river. When I drew still nearer to it, I perceived that it was formed by a legion of wood-pigeons, who kept continually up and down successively among the branches of an ever-green oak, in order to beat down the acorns with their wings. Every now and then some alighted to eat the acorns which they themselves or the others had beat down; for they all acted in common, and eat in common; no avarice nor private interest appearing among them, but each labouring as much for the rest as for himself." "The pigeons for their fine flavour and delicacy are preferred by Europeans to those of any other country."

Of the same region T. Jeffreys writes in 1760;[1] "The number of wood-pigeons which swarm here in winter, and in *Canada,* where they remain till autumn is astonishing; in *Louisiana* they feed upon acorns, in *Canada* they do much mischief by devouring the grain. They may be taken by finding out their recesses, and fumigating them with brimstone in the night. By this means they fall from the branches in heaps, and torches should also be provided to frighten them, and afford light at the same time for collecting them."

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[1] Jeffreys, T. The Natural and Civil History of the French Dominions in North and South America. 1760, Part I, p. 160.

In Georgia, in 1776, they observed that[1] "when it is very cold weather in the northern parts of America, here are vast flights of wild pigeons, which are very easy to shoot." In upper Louisiana Stoddard (1812) finds that the[2] "forests...., according to the best accounts, contain about a hundred and thirty species of birds. The most useful of them are several kinds of ducks.... the pigeon,...." In Texas, Kennedy, writing in 1841, says[3] "the sportsman,....will also find on land good store of....pigeons ....suited to the table."

Central States East of the Mississippi River.

In this wide region many interesting records occur of which the following are doubtless only a small portion. Daniel Coxe, in speaking of the country about Lake Erie, enumerates the[4] "pigeons" among his "wild animals of this country." In 1698 Hennepin, when on the River Ouisconsin, found that[5] "Six Charges of Powder was all that we had left, which oblig'd us to husband it as well as we could; wherefore we divided it into twenty to shoot only for the future at Turtles or Wild Pigeons."

In 1769, Bossu says:[6] "When one approaches the country of the Illinois, one sees, during the day, clouds of doves, a kind of wood or wild pigeons. One thing which may perhaps appear incredible, is that the sun is obscured by them; these birds living on nothing but beechnuts and acorns of the forests, are excellent in autumn; one sometimes kills as many as 80 of them at one shot." In 1772, 1773, Rev. David Jones, records in the Ohio valley [1] "not many pigeons." In Ohio the Rev. M. Cutler found pigeons as he had in Massachusetts (p. 98). When not far from Marietta on September 10 and 11, 1788, he entered in his journal the following: [2] "Saw some pigeons, but killed none." "Went on shore after pigeons alone,.... Killed one pigeon,...." In his trip to Miami, in 1785, General Butler on December 8, at Hebron, notes [3] "pigeons very plenty flying over." In 1792 John Heckewelder made a journey to the Wabash and on his trip along the Ohio observed that [4] "Sunday, December 2d the flight of wild pigeons was indescribable, the low-lands were entirely covered with them. The inhabitants, with few exceptions forgot it was Sunday and went out to shoot pigeons."

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[1] The History of North America. London, 1776, p. 225.

[2] Stoddard, Major Amos. Sketches Historical and Descriptive of Louisiana. Phila., 1812, p. 231.

[3] Kennedy, Wm. Texas: etc. 2nd edit., London, 1841, Vol. I, p. 130.

[4] Coxe, Daniel. *Vide supra,* p. 261.

[5] Hennepin, L. A New Discovery of a Vast Country in America, etc. London, 1698, p. 193.

[6] Bossu, M. Nouveaux Voyages aux Indes Occidentales. Premiere Partie, Amsterdam, 1769, pp. 96, 97.

In 1805 (September 2), when near Cassville, Wisc., Pike [5] "landed to shoot pigeons." April 16, 1806, at Brownsville, he also mentions that he "Shot at some pigeons at our camp." Several years elapse before Hulme's 'Tour in the Western Countries of America, Sept. 30, 1818–Aug. 8, 1819.' appeared. On June 23, 1819, we have this entry: [6] "See....thousands of pigeons. Came to Pigeon Creek, about 230 miles below the Falls, and stopped for the night at Evansville." At French Lick, July 5, 1819, he records: "Some of the trees near the Judge's [his host] exhibit a curious spectacle; a large piece of wood appears totally dead, all the leaves brown and the branches broken, from being roosted upon lately by an enormous multitude of pigeons. A novel sight for us unaccustomed to the abundance of the backwoods!" There appeared, this same year, the Edinburgh edition of Warden's three volume account of the United States. In it, he records[1] the pigeon as numerous in the Ohio valley, New Hampshire, New York, New Jersey, Pennsylvania, Tennessee, South Carolina, Louisiana, Mississippi, Michigan, Missouri, and Florida.

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[1] Jones, Horatio G. Journal of Rev. David Jones. In Cincinnati Miscellany. By Chas. Cist. Vol. II, p. 232.

[2] Cutler, W. P. and Julia P. Life, Journals and Correspondence of Rev. Manasseh Cutler. Cincinnati, 1888, Vol. I, pp. 98, 422.

[3] The Olden Time, Vol. II, 1847, p. 495.

[4] Penn. Mag. Hist. and Biog., Vol. XII, 1888, p. 182.

[5] Pike, Zebulon Montgomery, The Expeditions of, During the Years 1805–6–7. New edit. by Elliott Coues. 3 vols. N. Y., 1895. Vol. I, pp. 32, 206.

[6] Early Western Travels, 1748–1846. Edited by R. G. Thwaites. Cleveland, O., 1904, Vol. X, pp. 45, 63.

In 1819 Faux (Memorable Days in America, etc. London, 1823) also encountered the pigeon at Zainsville, Ohio, and in Tennessee. At the former place, October 14, he[2] "Wandered in the fields shooting pigeons, which is here fine sport; they fly and alight around you on every tree, in immense flocks, and loving to be shot. They are rather smaller than English pigeons, and have a lilac breast; but in other respects are blue, or blue grey. They breed in the woods, and seem to court death by the gun, the sound of which appears to call them together, instead of scaring them away; a fowling-piece well charged with dust shot might bring down a bushel of these willing game at your feet." In the latter instance he describes in detail a pigeon roost, which "is a singular sight in thinly settled states, particularly in Tennessee in the fall of the year, when the roost extends over either a portion of woodland or barrens, from four to six miles in circumference. The screaming noise they make when thus roosting is heard at a distance of six miles; and when the beech-nuts are ripe, they fly 200 miles to dinner, in immense flocks, hiding the sun and darkening the air like a thick passing cloud. They thus travel 400 miles daily. They roost on the high forest trees, which they cover in the same manner as bees in swarms cover a bush, being piled one on the other, from the lowest to the topmost boughs, which so laden, are seen continually bending and falling with their crushing weight, and presenting a scene of confusion and destruction, too strange to describe, and too dangerous to be approached by either man or beast. While the living birds are gone to their distant dinner, it is common for man and animals to gather up or devour the dead, then found in cartloads. When the roost is among the saplings, on which the pigeons alight without breaking them down, only bending them to the ground, the self-slaughter is not so great; and at night, men, with lanterns and poles, approach and beat them to death without much personal danger. But the grand mode of taking them is by setting fire to the high dead grass, leaves, and shrubs underneath, in a wide blazing circle, fired at different parts, at the same time, so as soon to meet. Then down rush the pigeons in immense numbers, and indescribable confusion, to be roasted alive, and gathered up dead next day from heaps two feet deep." In Michigan, 1819, Dana found that[1] "pigeons.... in autumn appear in swarms, and prey upon corn and new sown wheat."

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[1] Warden, D. B. A Statistical, Political, and Historical Account of the United States of North America, etc. Edinburgh, 3 vols., 1819. Vol. I, pp. 382, 496; Vol. II, pp. 38, 351, 411, 528; Vol. III, pp. 10, 55, 76, 139, 140, 223.

[2] Early Western Travels, Vol. XI, pp. 174, 175, 236, 237.

On September 27, 1820, James Flint in his 'Letters from America,' etc. (Edinburgh, 1822), finds that on the east side of the little Miami River[2] "The woods abound in pigeons, a small species of fowls which migrates to the southward in winter, and return to the north in spring. Their numbers are so immense that they sometimes move in clouds, upwards of a mile in length. At the time when they are passing, the people have good sport in shooting them, as one flock frequently succeeds another before the gun can be reloaded. The parts of the woods where they roost, are distinguished by the trees having their branches broken off, and many of them deadened by the pressure of the myriads that alight upon them."

In 'Travels from Detroit Northwest', etc., Schoolcraft when at Sandy Lake July 13, 1820 says:[3] "The....pigeon and turtle dove, occasionally appeared in the forest, to enliven this part of the journey." At Prairie du Chien, "The pigeon,.... are also common along this part of the Mississippi." In a much later work this same author uses the pigeon to illustrate the hurry and bustle of a busy town.[4] "Whoever has seen a flock of hungry pigeons, in the spring, alight on the leaf-covered ground, beneath a forest, and apply the busy powers of claw and beak to obtain a share of the hidden acorns that may be scratched up from beneath...."

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[1] Dana, E. Geographical Sketches on the Western Country, etc. Cincinnati, 1819, p. 262.

[2] Early Western Travels, Vol. IX, p. 301.

[3] Schoolcraft, H. R. Narrative Journal of Travels from Detroit Northwest, etc., in the year 1820. Albany, 1821, pp. 216, 356.

[4] Schoolcraft, H. R. Personal Memoirs of a Residence of Thirty Years with the Indian Tribes on the American Frontiers, etc., 1812–1842. Phila., 1851, pp. 95, 367.

In 1822, John Woods (Two Years Residence.... in the Illinois Country, etc., London, 1822) writes that[1] "The birds [of the country] are...., pigeons, doves,..... Pigeons are sometimes in immense flocks, smaller than the wild pigeons, but larger than the tame ones of England. A great number of doves, much like turtle doves." "In my two journeys I saw a great number of wild-ducks and pigeons on the banks of the Wabash; although a bad shot, I think if I had had a gun, I could have killed a great many." His third and last note is September 1, 1820: "We have had large flocks of pigeons, from the north, almost continually passing over us for the last week."

On the Fox River, just before September 1, 1827, Thomas L. M'Kenney found[2] "pigeons.... numerous." In the same year W. Bullock (Sketch of a Journey through the Western States of America, etc., London), when at Cincinnati, Ohio, says,[3] "the farmyard abounds with *wild* pigeons, as tame as our domestic ones." The following year (1828) Timothy Flint records in Indiana that[4] "in some seasons, wild pigeons are seen here in countless numbers. Where they roost, the limbs of the trees are broken off in all directions by their numbers."

Of the period 1830–1840 one pioneer in Michigan says:[5] "Of the pigeons [they came] by the million," and recalls "their digging acorns out of the deep snow." In 1835 there appeared 'Sketches and Eccentricities of Colonel David Crockett' in which a long description of a pigeon roost appeared (pp. 193, 194.) "The habits of the wild pigeon have long been a subject of much curiosity. The great numbers in which they appear, and the singular propensity that they have to roost together, have for some time been a source of speculation. They frequently fly as much as eighty miles to feed, and return to their roost the same evening.

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[1] Early Western Travels, Vol. X, pp. 291, 315, 345.

[2] M'Kenney, Thomas L. Memoirs, Official and Personal, etc. 2 vols., New York, 1846. Vol. I, p. 104.

[3] Early Western Travels, Vol. XIX, p. 140.

[4] Flint, Timothy. A Condensed Geography and History of the Western States on the Mississippi Valley. Cincinnati, 1828. Vol. II, p. 163.

[5] Michigan Pioneer and Hist. Colls., Vol. XIV, p. 512.

This was proved by shooting them at their roost of a morning when their craws were empty, and then shooting them again in the evening when they returned. Their craws were then found filled with rice, and it was computed that the nearest rice-field could not be within a less distance than eighty miles. I have often seen pigeons roosts in the older states, but they scarcely give an idea of one in the west. I have seen a cloud of those birds cover the horizon in every direction, and consume an hour in passing. And near a roost, from an hour before sunset until nine or ten o'clock at night, there is one continued roar, resembling that of a distant waterfall. A roost frequently comprises one hundred acres of land; and strange, though literally true, as can be attested by thousands, the timber, even though it be of the largest growth, is so split and broken by the immense numbers which roost upon it, as to be rendered entirely useless. There are few persons hardy enough to venture in a roost at night. The constant breaking of the trees renders it extremely dangerous; and besides there is no necessity for shooting the birds, as the mere breaking of the limbs kills many more than are taken away. A pigeon roost in the west resembles very much a section of country over which has passed a violent hurricane. Wolves, foxes, *etc.*, are constant attendants upon a pigeon roost."

In Ohio, Caleb Atwater says:[1] "The wild pigeon comes in the spring, sometimes in March, or even earlier, on his journey north, and after paying us a visit, of about a month, passes on his journey. In September he returns to see us again, spending six weeks with us, feasting on the pigeon berry, phytolacca decandra, the new acorns, and other nuts, and such food as the country produces for his use. Formerly the pigeons tarried here all summer, building their nests, and rearing their young; but the country is too well settled for them now; so, like the trapper for beaver, and the hunter, they are off into the distant forests, where their food is abundant, and where there is none to disturb them in their lawful pursuits."

Upon Lake Michigan Jas. H. Lanman records:[2] "During certain periods, violent thunder storms rage....; and the shore has been known to be covered with the skeletons of pigeons and gulls, which had been drowned in crossing at such times. Eagles, in great numbers, also frequent these shores, in order to glut themselves upon their dead bodies, which are thrown upon the beach."

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[1] Atwater, Caleb. A History of the State of Ohio. 2nd edit., Cincinnati, 1838, pp. 93, 94.

[2] Lanman, Jas. H. History of Michigan, etc., New York, 1839, p. 278.

In Indiana, at New Harmony, Maximilian, Prince of Wied, finds[1] "pigeons,....were seen in the orchards during the whole winter." In the same State at a somewhat later date (1849), the 'Indiana Gazetteer,' (3rd edit., Indianapolis, p. 15) records: "A place called the Pigeon Roost, in Scott county, was formerly so much resorted to by Pigeons, that for miles nearly all the small branches of a thick forest were broken off by their alighting in such numbers on them, and the ground was covered with their ordure several inches in depth for years afterwards. In the south-east corner of Marion county there was a similar Pigeon Roost, and several others in the State have been mentioned."

Finally, Ferris's note of Michigan says:[2] "The wild pigeons, in countless numbers, will hover, and flutter, and flap among the bur-oaks."

West of the Mississippi Valley.

In this wide expanse of territory the pigeon is not so common as eastward of the Mississippi. The roll of records is not extended. It begins with the Lewis and Clark Expedition. When near 47° 3′ 10″ north latitude July 12, 1805, Patrick Gass says,[3] "Here we saw some wild pigeons and turtle doves." A day later (July 13, 1805), at White Bear Islands (Missouri River), Lewis says:[4] "I saw a number of turtledoves and some pigeons today, of the latter I shot one; they are the same common to the United States, or the wild pigeon as they are called." Near the same place one year later, July 12, 1806 he again[1] "saw...., pigeons, doves; etc. the yellow Currants beginning to ripen." On Aug. 26, 1805 Clark near Shoshone[2] saw "Some fiew Pigions," as did he on July 21, 1806 (Missouri River), July 5, 1806, and Feb. 12, 1804 (near St. Louis, Mo.).[3]

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[1] Early Western Travels, Vol. XXII, p. 195.

[2] Ferris, J. The States and Territories of the Great West. N. Y. and Auburn, 1856, p. 176.

[3] Gass, Patrick. Journal of the Voyages....of Capt. Lewis and Capt. Clarke, etc. 4th edit., Phila., 1812, p 107.

[4] Lewis and Clark Expedition, 1804–1806, Original Journals of. Edited by R. G. Thwaites. 8 vols., New York, 1904–5. Vol. II, p. 227.

In 1811, Brackenridge made a voyage up the Missouri River, and May 7, when near the mouth of the Platte,[4] "killed some pigeons." In 1817, Maj. Stephen H. Long went in a "six-oared skiff to the Falls of Saint Anthony." In the course of his journey, near Lake Pepin, July 18, he[5] "killed a few pigeons."

In 'A View of the Lead Mines of Missouri' (New York, 1819), Schoolcraft says (p. 37), "pigeons,.... in some parts of the interior, are so numerous that the woods seem alive with them." In an 'Account of an Expedition from Pittsburgh to the Rocky Mountains, performed in the Years 1819 and '20,' etc., under.... Maj. Stephen H. Long,"[6] "*Columba migratoria* — Passenger pigeon (*C. Canadensis* is the female. Temm.)" occurs in the list of birds; at Engineer Cantonment (Council Bluffs), "*Columba migratoria* arrived May 2, 1820"; and lastly, August 28, "Several small flocks of the common wild-pigeons flew by us both yesterday and today, in a southerly direction." The same commander, in his expedition to the St. Peter's River, etc., in 1823, when on the above river says:[7] "The party that travelled in the boats, saw abundance of pigeons, but with the exception of these, no other kind of game;.... The land party, although provided with an excellent hunter, killed but a few pigeons;...."

In 1820, Stephen W. Kearny, in 'A Narrative Account of the Council Bluffs, St. Peter's Military Expedition,' etc., says that July 22, 1820, they[8] "followed up, on the margin of the river, seeing.... great many Pigeons, several of which we shot...." On August 5, at "Bear Creek," they "Started at 4 A. M. passed 'Bear Creek' on the *West* and at breakfast time stopped at a small Island, where we saw a large flock of pigeons, and secured 8 of them for our dinner." The year following, 1821, Schoolcraft, observed [1] "the beautiful passenger pigeon." In Missouri, 1828, Flint says: [2] "Turtle doves are always numerous, as in some seasons are the wild pigeons." In 1832 he observes that [2] "Pigeons sometimes are seen in great flocks. Their social and gregarious habits incline them to roost together, and their places of resort are called 'pigeon roosts.' In these places they settle on all the trees for a considerable distance round, in such numbers, as to break off the branches." The same year Schoolcraft, in a 'Narrative of an Expedition through the Upper Mississippi to Itasca Lake,' etc., in 1832 (New York, 1834, pp. 54, 106), "saw.... the common pigeon, which extends its migrations over the continent."

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[1] Lewis and Clark Expedition, Thwaites ed., Vol. V, p. 200.

[2] *Ibid.*, Vol. III, p. 44.

[3] *Ibid.*, Vol. V, p. 279; Vol. VI, pp. 169, 221.

[4] Brackenridge, H. M. Views of Louisiana, etc. Pittsburgh, 1814, p. 225.

[5] Coll. Hist. Soc. Minnesota, Vol. II, p. 44.

[6] James, Edwin. Account of An Expedition....under....Maj. Stephen H. Long, etc. 2 vols., Phila., 1823. Vol. I, p. 373, 377; Vol. II, p. 231.

[7] Keating, William H. Narrative of An Expedition to the Source of St. Peter's River, Lake Winnepeek, Lake of the Woods, etc. Performed in the Year 1823, etc. under....Maj. Stephen H. Long, 2 vols. Phila., 1824, p. 292.

[8] Kearny, Stephen Watts, The 1820 Journal of, edited by V. M. Porter, pp. 23, 42. Reprinted from Missouri Hist. Soc. Coll., Vol. III, 1908.

The next year (July, 1833), at Big Muddy River, Maximilian, Prince of Wied, in his 'Travels in the Interior of North America,' says: [3] "Messrs. Bedmer and Mitchell made an excursion into the wood, where they saw many wild pigeons,...." At old Fort Clarke they found the wild pigeon, also along Cannonball River, N. D. In 1834, John K. Townsend made 'A Journey across the Rocky Mountains to the Columbia River,' and says, [4] "when beyond St. Charles, Mo., March 31, in the morning, we observed large flocks of wild pigeons passing over...." At Powder Creek, August 28, he says, "Game has been exceedingly scarce, with the exception of a few grouse, pigeons, ..."

One year later, in November, 1855, Dr. Williamson, when among the Dahkotahs, wrote to the 'Cincinnati Journal' that [5] "Exclusive of their corn, their feed consists.... in the summer, [of] roots, fish, wild pigeons, and cranes." In 1837, Alphonso Wetmore, states:[1] "The game of Missouri, the ranks of which are thinned as settlements advance, consists of.... wild pigeons...."

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[1] Schoolcraft, H. R. Travels in the Central Portions of the Mississippi Valley. New York, 1825, p. 72.

[2] Flint, T. A Condensed Geography and History of the Western States, etc. Cincinnati, 1828, Vol. II, p. 73; also The History and Geography of the Mississippi Valley, Cincinnati, 1832, Vol. I, pp. 72, 200.

[3] Early Western Travels, Vol. XXIII, pp. 32, 250; XXIV, p. 86.

[4] Early Western Travels, Vol. XXI, pp. 126, 269.

[5] Neill, Edward Duffield. The History of Minnesota, etc., Philadelphia, 1858, p. 445.

In 1848, James Hall, who has written so much of the West says:[2] "I have never seen any of those *pigeonroosts*, which have excited so much curiosity, and where these birds are said to alight in such quantities as to break down the limbs of the trees." Lastly, in 1851, J. W. Bond, in 'Camp Fire Sketches' writes:[3] "Today [August 24, 1851], our French-Canadians and half breeds, who had charge of the provision and baggage-carts, have been shooting pigeons...."

A COMPARATIVE STUDY AT COBB'S ISLAND, VA.

BY ALFRED B. HOWELL.

ON June 22, 1909, I arrived at Cobb's Island, Virginia, equipped for a week's stay, having made the trip solely for the purpose of ascertaining the conditions then prevailing among the water birds breeding there, in order to compare them with the facts gathered by Mr. T. Gilbert Pearson in 1892 (Oologist, Vol. IX, No. 8) and Mr. Frank M. Chapman in 1902 (Camps and Cruises of an Ornithologist) in the same locality. I chose this island in preference to others because it was the most accessible of any of the large breeding grounds, and because it is uniformly well known.

There is frequently a change from year to year in the prevalent conditions among a colony of birds, until at the end of a decade, it has often become very pronounced. Sometimes these changes can be ascribed to known causes, and again the reasons are veiled in mystery even to the most observant.

In the good old days Royal and Least Terns bred upon the island by the thousands, but they have been driven away and neither of them has bred in the locality for years. Willet also were extremely abundant at one time, but this cannot be said of them at present. Following is a list of breeding water birds found upon the island at the three different periods referred to. Mr. Pearson in his paper, failed to give the approximate numbers of birds observed of some of the species, and therefore I am compelled to estimate from the general trend of the article.

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[1] Wetmore, Alphonso. Gazetteer of the State of Missouri. St. Louis, 1837, p. 29.

[2] Hall, James. The West: Its Soil, Surface, and Productions. Cincinnati, 1848, p. 124.

[3] Bond, J. W. Minnesota and its Resources. New York, 1853, p. 257.

	Mr. Pearson 1892	Mr. Chapman 1902	A. B. Howell 1909
Laughing Gull, *Larus atricilla*	common	several hundred	2000
Gull-billed Tern, *Gelochelidon nilotica*	mere mention	16	16
Forster's Tern, *Sterna forsteri*	considerable number	small number	0
Common Tern, *Sterna hirundo*	considerable number	several hundred	300
Black Skimmer, *Rynchops nigra*	large number	thousands	300
Willet, *Catoptrophorus semipalmatus*	10	2	4
Wilson's Plover, *Ochthodromus wilsonius*	not uncommon	2	0
Oyster-catcher, *Hæmatopus ostralegus*	several pairs	2	0

The stories which I heard concerning the wholesale slaughter of *Sterna antillarum* in past years are almost beyond belief. For ten cents apiece, men shot these birds until their shoulders had become too raw to fire a gun: shot them by the hundreds and the thousands as long as there were enough left to pay for a morning stroll. Small wonder that they have been wiped out entirely in this locality. The scarcity of the Willet, Oyster-catchers and Wilson's Plovers can be ascribed to the depredations of visiting sportsmen. I searched in the marshes for Forster's Terns, but in vain, for although I caught a glimpse of what may have been one of these birds, I cannot be sure. The Gull-billed Terns seem to be holding their own, as do the Common Terns, which latter are apt to be found nesting anywhere along high water marks, but seem to prefer the colonies of Skimmers.

The most interesting problem was the reason for the rate of increase and decrease in the numbers respectively of the Laughing Gulls and Black Skimmers. The latter were nesting in four rather small colonies several miles from the Life-saving Station, and as they nest later than, and their eggs are smaller than those of the Gulls, the fishermen confine their attention almost exclusively to the nests of the latter. More than this, the people of this section have a more kindly feeling towards the Skimmers than the Gulls, and the plumage of the former has always been of even less value commercially than that of the latter. The nests of the Laughing Gulls are robbed by the fishermen twice, so I am told, and at the third setting of eggs, are left in peace, but one would think that even with this slight encouragement, they would leave the island for more favorable localities. However, they are thriving and growing fat and increasing from year to year, while the sea dogs, as the Skimmers are called locally, seem destined to take the trail back to the Southland. Nor can their growing scarcity be due to high tides flooding their nests, for these as a rule are higher above the water than are those of the Gulls. The only explanation that seems to be left is one which Mr. E. J. Court of Washington, assures me is now accepted by the majority of ornithologists who are conversant with the conditions of that section. It is that the schools of a certain small fish on which the Skimmers feed almost exclusively, have within the past few years forsaken the locality, and that now there are only enough left for the few birds remaining. Another reason that some have advanced is that during a series of heavy winter storms several years ago, the southern end of the island was washed away. However, as fully nine tenths of the original island is left, this supposition seems to be hardly worth mentioning.

Clapper Rails (*Rallus crepitans*) are found upon the island in the greatest abundance, and evidently have always been just as numerous. At this time, most of their eggs were pipped, and a few sets had already hatched. A habit which the Rails had was that of very often placing their nests within about three feet of those of the Gulls. I am sure that this was from no feeling of friendship, for the Gulls love to tease the Rails, and I have seen them swoop at the latter on their nests, while the victims danced up and down in great fury at not being able to reach their tormentors. In one nest of *crepitans* containing eggs of the rightful owner there were two eggs of the Laughing Gull, but these had been pushed to one side. These birds' nests were very easy to find on account of the tall marsh grass being bent over them toward the center, dome-fashion.

I took an umbrella blind with me in order to facilitate my photographing, and also to study the nesting birds at close range. It is no light work to start out for a walk of six miles through the soft sand laden down with a heavy camera, several dozen plates, large umbrella tent and other paraphernalia, not forgetting the water bottle, when the thermometer is registering one hundred and two. However, this was refreshing compared to the dreadful heat which I experienced with the sun pouring down upon my blind after I had crawled into it and closed every cranny except two small holes. Complete quiet had settled down among the birds in less than an hour.

Mr. Chapman was the first to disprove the popular falacy that the Skimmers incubated only during the night and in cloudy weather, and I also observed that they incubate throughout the brightest days, although they are very restless, remaining on the nest for but a few minutes at a time. One would alight on the sand, waddle up to the nest and after inspecting its contents, settle down upon the eggs. Then almost invariably she would cock her eye at the sun, and finding that orb fully up to her expectations, she would give over her thoughts to serious business for a while. This species is to me at least, one of the most interesting of the sea birds. They have a certain ease of flight that is not surpassed even by the Terns, and to see one quartering the little tide creeks at dusk is enough to stir the interest of the most blasé ornithologist. They often fly in straggling flocks of about a dozen individuals, and when passing, strongly remind one of a pack of hounds on the trail, as Mr. Chapman so aptly puts it, for their cry is an almost exact counterpart of the yelp of a hound.

In the middle of the day when one decides to feed, he often chooses a place where a wave has broken and is receding down the beach. Then he flies along where the water is about two inches deep, skimming with his lower mandible beneath the surface. At such times, he hits bottom every twenty feet or so, and his head is jerked back in a most comical manner.

The Gull-billed Terns were the only birds which continued to be suspicious of my blind, and the Common Terns accepted it as a necessary evil within a half hour.

During my stay I spent in all about eleven hours in my blind within sight of many Gulls, but they seem to be less rapacious than some of their cousins, for I saw them attempt to steal eggs only once. In this locality and at this time of year the Gulls feed almost exclusively on soft-shelled crabs, which they capture with great dexterity.

Other species of birds observed on the island were:

Green Heron (*Butorides virescens*), one.

Osprey (*Pandion haliaëtus carolinensis*), one.

Phœbe (*Sayornis phœbe*), one pair breeding.

Red-winged Blackbird (*Agelaius phœniceus*), several, probably breeding.

Meadowlark (*Sturnella magna*), one pair.

Seaside Sparrow (*Passerherbulus maritimus*), abundant, chiefly at the northern end of the island.

Song Sparrow (*Melospiza melodia*), common.

Barn Swallow (*Hirundo erythrogastra*), four pairs breeding.

BIRD PROTECTION IN FOREIGN LANDS.

BY G. EIFRIG.

IN MAY, 1910, the "First German Convention for Bird Protection" was held at Charlottenburg, near Berlin, Germany. This representative gathering had assembled at the invitation of four of the largest and most important societies devoted to the study and protection of birds in that country. What impresses one most forcibly when reading of such societies and their deliberations in Germany and England, is the high standard of excellence in the speeches held and lectures delivered, and, what should probably be mentioned first, the great number of influential people, men and women, who take an *active* interest in these things over there, such as members of government, both national and state, university professors, principals and teachers of high and public schools, foresters, etc. The logical thoroughness and system, for which Germany is well known, also show themselves here, and in consequence the resolutions adopted at such meetings usually find a prompt acceptance on the part of the national or state governments, which make them effective by issuing the necessary orders.

One of the many excellent addresses delivered at the above named convention struck the writer as being particularly interesting and instructive and deserving of being more widely made known. It is entitled "Der Vogelschutz im Auslande," (Bird Protection in Foreign Countries), and was delivered by Staff veterinarian, Dr. Heuss of Paderborn. He takes up the countries in which efforts tending toward bird protection are made in alphabetical order, and we, though by no means making a literal translation of his statements, do the same, with the exception of substituting for his remarks on the United States, which we do not need for our purposes, such on Germany, which naturally are omitted by the speaker over there.

BELGIUM. Although this is one of the backward countries as regards bird protection, even here such a movement is making headway. The first hopeful sign is the founding of the "Societé belge contre le port des Plumes" under the energetic leadership of Madame van Hoorde of Brussels. The government also seems to be alive to its duties under the Paris convention, which it had joined. It has forbidden the shooting of gulls, and an order of the agricultural department has put more birds on the protected list, including the Wood Pigeon (*Columba palumbus*). The forestry branch is combating the caterpillar pest by putting up drinking places for birds in dry parts of the country, to thus attract birds to them once more. Otherwise the Belgians are among the worst sinners against birds. Great numbers of finches, larks, even nightingales are caught in nets and otherwise, plucked and put up for sale in cities.

DENMARK. Here the very active propaganda for bird protection is continued under the leadership of the "Soalen" society, of which Mrs. (Col.) Malvine Mehrn is president. In a circular to all the bishops of the country, entitled "Church and protection of animals," the attention of the reverend gentlemen is drawn to the ethical aspect of the protection of animals in general and that of birds in particular. Many illustrated lectures are held before schools and societies, and the audiences at such are always large and appreciative. In a memorandum sent to the board of directors of the royal railways, it was proposed that the railway embankments should be planted with trees and berry-bearing shrubs, to furnish the birds with nesting sites and winter food.

ENGLAND, with her colonies, affords a very gratifying example of systematic and earnest endeavors in bird protection, successfully directed and carried out. The bill which Lord Avebury introduced into Parliament, designed to combat the evils arising out of the sale of birds' skins and feathers, found a ready response in many circles, and Mr. James Buckland of the Royal Colonial Institute, and the Royal Society for the Protection of Birds are leaving no stone unturned to bring the matter to a successful finish. In the meantime Lord Crewe, Minister of State for the Colonies, has called together a commission of experts of the Colonial Office and of the National Museum of Natural History to devise ways and means how the wholesale destruction of birds in the interest of fashion may best be stopped in the different parts of the empire. The above named society also merits praise for issuing, under the English title 'How to Attract and Protect Wild Birds', the well known book by Hiesemann, the appropriate foreword of which having been written by the skilful pen of the Duchess of Bedford. At the same time a sales agency for the food and nesting appliances designed by Baron von Berlepsch has been opened. A noticeable resolution was adopted by the British Ornithologists' Union, at a special general meeting, namely this, that a member who is found guilty of having killed or having aided and abetted the killing of certain birds, is to be suspended from membership.

[In CANADA the status of bird protection is, generally speaking, satisfactory. Most provinces have bird laws upon their statute books which are nearly or entirely like the Audubon model law.

Spring shooting of ducks and shorebirds is prohibited in most Provinces, which is more than can be said of some States in the Union. Restrictions on the shipping of game are in force, where it is not entirely forbidden, as well as hunters' licenses. From personal interviews the writer knows that Sir Wilfred Laurier is heartily in accord with the idea of bird protection, he is in fact a great lover of nature and close observer of birds. Not so much can be said of the present Minister of the Interior, but even he was willing to set aside islands in the lakes of the great northwest as bird reservations. If the A. O. U. or the National Audubon Society would send one or two well posted people to Ottawa, when the political waves do not run as high as now, no doubt something could be done to help in establishing bird refuges on what is practically worthless land, to have parts of the shore of the oceans put under the surveillance of the light house tenders and life savers, etc. Meanwhile birds are fully protected at all times in the extensive national and provincial parks and forest reservations.]

In FRANCE, unfortunately, conditions are not so favorable, they, in fact, being more like those of Belgium and Italy. While the cause of ornithology and bird protection has recruited a powerful protagonist in the "Revue française d'Ornithologie scientifique et pratique," published monthly by Henri Tressier in Orléans and ably edited by M. Louis Denise, librarian of the National Library, and Dr. A. Menegaux, assistant curator at the National Museum in Paris, strong complaints continue to be voiced regarding the wholesale killing of small insectivorous and song birds in southern France. M. Perier, a deputy from that part of the country, has calculated that in his election district alone no less than 700,000 birds had been caught and killed in five months!

[In GERMANY the idea of bird protection is probably most thoroughly and systematically carried out. The birds always had a better chance there — except in the districts where netting was formerly carried on, a practice which has now been stopped by an act of the Reichstag — because the gun "toting" habit, so prevalent here, was always unknown, especially on the part of boys. But now, since the Reichstag passed the famous law just alluded to, followed by the legislatures of the different states, a veritable flood of measures, designed to protect birds and increase their numbers, are being enacted by cities, villages, park boards, land owners, etc., to aid in this movement. The nesting boxes and feeding apparatus for birds, designed by von Berlepsch, are installed wholesale in many places, and the other ways and means tried out and perfected by him on his model bird station are introduced. Vagabond cats are caught and destroyed. Waste land is planted with shrubbery, the ministries of the several state railways direct that this be done also along the railway embankments; farmers, laborers, school children, students are led to take an active part in the work, until it has become a national movement. The summer resorts at the sea coasts have tended to drive away sea birds; this is overcome by establishing reservations along the coast, much as in this country, with gratifying results. The best known of these are along the coast of the North Sea: Jordsand, Ellenbogen, Norderoog and Memmert, and Langenwerder in the Baltic Sea. State boards of forests and private forest owners also help in this work, and the result is a surprisingly large bird population, which was forcibly brought home to the writer, when on a trip to Europe in 1908.]

ITALY [still is the *bete noire* of European bird protection. After having long ago nearly depleted the country of resident birds, the Italians now lay in wait for the hordes of migrant birds from central and northern Europe and net and kill them by the thousands. The strings of even the smallest dead song and insect-eating birds for sale in the Italian cities are well known to all travelers there and are objects of repugnance to them.] But more and more influences are setting themselves to work against this slaughter of the innocents and the cruelties perpetrated in connection with it. Anticruelty and bird protective societies, as well as individuals, are competing to bring the agriculturists to a sense of the harm they are doing themselves and the country at large by their wanton destruction and to show them the benefits conferred upon them by birds. This is done by leaflets, pamphlets, and newspaper articles. Especially praiseworthy in this respect is the literary activity displayed by Dr. Casoli, physician at Cevoli near Pisa, and by L. Riccabone of Turin in his journal 'Il mondo animale,' the 'Animal World.' Another step in the right direction is the prohibition of using live pigeons in shooting contests, which has hitherto been a prominent source of popular enjoyment.

[In AUSTRIA-HUNGARY, strange to say, the preponderance in respect to bird protection is with the second partner in the dual monarchy. We, in America, generally speaking, usually have no very high opinion of Hungary and things Hungarian, but as regards this movement, we must take off our hats to them. Hungary is nearly, if not quite, at the top of the ladder in bird protection. What is being introduced and tried out in this respect in other countries for the last five years, has been known and established in Hungary for many years past.] This is owing to the energetic and devoted and practical leadership the movement has found here early, in the person of the venerable Otto Herman, who with youthful energy, is still keeping it at the height of perfection. Owing to the initiation of the Royal Hungarian "Zentrale" for bird protection, the International Agricultural Congress at Rome in 1909 passed several noteworthy resolutions aiming at the better protection of birds in the various countries represented. Surely, a gratifying achievement.

In Austria itself, the other part of the dual monarchy, the council of Vienna, the capital, leads in putting ordinances on the statute books, which aim at protecting and attracting birds. Permits to trap birds for cage purposes are no longer issued in Vienna. Lower Austria has also recently passed a bird law, in which all birds are divided into three kinds, useful, harmful and indifferent. The first may not be caught or killed throughout the year; the harmful ones may be taken at any time, subject, however, to the limitations placed on this by the game and fish police; for the indifferent ones a close season lasting from February 1 to September 15 is established.

In NORWAY it is especially the Christiania society for the protection of animals, under the excellent leadership of the royal equerry Sverdrup, that is doing telling work. In a circular addressed to all the town and village councils in the country, these were made acquainted with the leading principles of bird protection. The monthly journal of the society, 'Dyrenesven,' in each number contains essays and news concerning bird protection.

In SWEDEN a similar activity is shown by the "Ladies' Society for the Protection of Animals," whose president is the Countess Anna Runth. This society is lately organizing the young people of the country for its purposes and this will, no doubt, lead to better protection for birds.

SWITZERLAND. The little model republic, naturally takes no back seat also in this matter. It is fully abreast with other countries. Here too the women are just now doing good work for the cause. Thus the 'Ligue féminine romande contre la destruction des oiseaux pour la parure' has lately issued a brochure entitled 'Le massacre des oiseaux et les crimes de la mode,' in which the pernicious results of the wholesale slaughter of birds to satisfy the whims of fashion are pointed out. This agitation is also carried into the daily papers and into the schools.

[For the UNITED STATES, the great work carried on by the Audubon Society, under the excellent and self-sacrificing leadership of Mr. W. Dutcher, is highly commended.]

VENEZUELA, even, has fallen in line and has determined upon a generous and, as is to be hoped, efficient policy to avert the threatened extinction of the beautiful egrets which are to be found there. On the 18th of April, 1910, a special law was passed, in which all killing of the egret is forbidden. This has sent a cold shudder down the spines of the Parisian feather dealers, who thereupon got a bogus "naturaliste-explorateur" to write a pamphlet in which he bravely lied that when the plumes of the egrets were taken not a single bird was killed, etc. [How much this falsehood is one "of whole cloth," was recently shown in 'The Auk' and in 'Bird-Lore.']

And finally BRAZIL has taken its place among the enlightened nations. On the 15th of January, 1909, a law was passed which protects all birds that are beneficial to agriculture and also prohibits the killing of rheas, gulls, terns, storks and herons, as also the taking of eggs and destroying of nests and the taking away of the nestlings. It is made incumbent upon the municipal councils to make this decree known as widely as possible and to enforce its provisions.

N. B. The matter in brackets has been added by the translator.

CONCEALING-COLORATION: A DEMAND FOR INVESTIGATION OF MY TESTS OF THE EFFACIVE POWER OF PATTERNS.

BY ABBOTT H. THAYER.

In 1896 naturalists received from me ('The Auk,' April, 1896) the first analysis of the effacing-power of counter-shading, and in the same article the discovery of the concealing-power of patterns (then accredited by me, through misinformation, to H. W. Bates as a previous discoverer). Soon after, I secured acceptance for the counter-shading part by proving that it was possible so to counter-shade an object as to make it invisible. *The same inevitable recognition awaits the similar effacing-power of pattern, whenever naturalists will come and study my proofs.* I, to whom they already acknowledge their debt for the discovery of counter-shading, demand to be trusted that it is I alone who am in a position to judge whether they need to study these proofs.

It begins to seem necessary to try once more to convince those naturalists who oppose me that they are acting on a misunderstanding, reiterating statements that I have never contradicted, and refusing either to notice what I do state, or to study optics itself, which is purely and simply the thing I am communicating to them.

Up to the present moment there is not a naturalist in the world who has seen any representative number of my tests of animals' costumes' background-reproduction, or who has any adequate conception what they really are. A few naturalists have seen a very few of them; and in the main those who have seen the most are the most convinced, while those who have seen none are the ones who are most loudly ridiculing the whole thing. It is among these latter that there exists an idea that the remarkable disappearance of each brilliant costume against a *certain* background merely proves my ingenuity.

When, for instance, I take a bird and spend an hour in finding a type of vegetation, situation and view-point in which he is absolutely indistinguishable, this operation is open to two interpretations. To the superficial and unreceptive observer it represents merely my ingenuity. To the eye of science it is the ascertaining whether the background against which the bird can disappear is typically such a one as that against which he would commonly be looked at by his enemy or prey.[1] Invariably, it is the establishment by this means of the fact that his costume is a case of concealing-coloration. For it is evident that to match any one type of background,— sky, vegetation, or earth,— is all that any costume could do. When all these costumes prove to match the very backgrounds we think they most need to, the grounds for imputing to them other reasons for their present extremely complicated and exact development seem to lag superfluous.

For instance, the vast class of black-and-gold species, so long called conspicuous (birds, insects and reptiles), are essentially confined to regions of vegetation,— that is, where sunlight and shadow convert the whole scene itself into black and gold. Black and gold is more than nine tenths of the aspect of the deepest parts of such forest foliage as the sun can penetrate. This fact, apparently so unfamiliar to naturalists, is proved by the former fact, that amidst such a scene the black-and-gold species so closely match as to be apt to pass unnoticed if they keep still; — and a similar correspondence holds clear through the entire animal kingdom.

Many naturalists have an absurd idea that I am telling them they cannot see these species where they are conspicuous. I am merely showing them that nature could do no more than she has done to hide these species, condemned as they are by aërial habits to many moments of contrasting background, which inevitably reveal their motion. Further, that the home of the black-and-gold class is where the typical background is black and gold; — and that this principle applies to all classes the world over. An unthinking person must go on talking about the many creatures that he *sees*, and never reflect on the evidence that he *misses* many others. If any doubter would, for instance, place an artificial bird the size of a peacock up in the sunlit trees, and try to color it so that it would show less in the first twenty different situations he tried for it, than a real stuffed (or live) peacock proved to show, he would begin to learn something that he has never yet dreamed of.

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[1] It is even the *only* means of forcing the less imaginative observer to perceive that he would always fail to detect any motionless *live* animal that happened to be as favorably backgrounded, and hence to perceive that there *is a percentage of them that he does not discover.*

Hummingbirds are a beautiful demonstration of the fact that even *almost constant conspicuousness* is no evidence that the costume of a species is not obliterative. On the contrary, it will soon be recognized that the very climaxes of obliterative coloration are to be found, just where one would expect, among the very species whose activities condemn them to the greatest conspicuousness. A feeding hummer's incessant motion makes him practically one of the most conspicuous of birds; and yet, behold, when you place a *still* one anywhere amidst the same flowers, you discover that he is as exquisitely effaced by background reproduction as any barkmoth or wood frog. The very same thing is true of the flamingo, the zebra, the peacock, and, of course, the world of species of which these happen to seem to us to be climaxes.

Now, as soon as the objecting naturalists understand that by *concealing-coloration* our book means coloration that works where it is most needed, and not necessarily elsewhere, and when their attention has been called to the fact that the more the butterfly or hummer matches the flower-masses where he has to risk his life the more he must show elsewhere, they will have begun to study. On the sea, when Dr. Townsend detected all the white-backed male eiders, and not the brown females, the flock was in dark water, probably between him and the cliff. At sea, there is almost all the time a dark direction and a light one, according to the sky,— silvery water to port and dark to starboard. In the one the white eiders vanish, in the other, if it be excessively dark, the brown ones are the dimmest, but, to equal the perfect vanishing of the males when they are in bright water, the females need to be seen in actual cliff-reflection. Once out beyond these reflections, the brown eiders on a calm sea are dark spots from almost every view-point, while the white parts of the males totally disappear whenever they are looked at toward the light. I too have seen eiders, both American and European, the latter by hundreds; but this was not necessary: any white birds on the sea will do, and the case of old and young gulls is just as good to study.

The oft-repeated objection that the wearers of these costumes perpetually reveal themselves by motion, and that consequently my tests give a wrong impression, is just what shows lack of taking in what my investigation is. My whole assertion is that the *costumes* of these creatures are not what reveal them, and the objector's repeated declaration that the real animal moves and shows himself simply backs me up. The use of motionless stuffed skins is the pure method of studying the effect of the patterns *apart* from that of motion.

In behalf of those who would like to trust our book, there are a few things that it is best to say about the recent attack on it by Dr. Thomas Barbour and Mr. J. C. Phillips. These men have committed toward us many offenses. They have tried to write down a book which they prove that they have never read with any thoroughness. One example must here suffice. They write that in their judgment a flamingo would look *dark* against a dawn or evening sky,— saying this with the evident aim of implying that we state the contrary. In our text twice, and *five times* in the legends over the pictures, we clearly go over this point. Seven times in all. Their article contains four or five other serious misrepresentations of our book, aside from several misstatements about my private history.

As to Mr. H. C. Tracy's studious and most courteous article on white top marks as directive in flight, it is as obvious to me as to him that whatever constant pattern a creature wears is sure to aid in its *recognition*, both at rest and in flight. Also, that *if* he were right that white patterns displayed in flight tend to make the wearer's *course* more conspicuous to its companions, these patterns might be assumed to owe their existence in corresponding degree to this use. The trouble is, however, that it seems plain that such is not the case. Flight implies being more or less higher than the ground. In the open, the *first* bird to take flight is seen by his companions against sky, *or at the angle where sky is to be expected*, and from this view his whites tend to efface him. Then, when many birds are on wing together in the open, they are on an average moving on a level, *i. e.*, on a tangent to the earth's surface,[1] and their *average* background to each other's eyes is the bottom of the *sky*, not the earth. In the woods the case is still stronger, There even the best-illuminated white is so deeply (green-) shadowed as to average dark green-gray against the actual sky-glimpses above. Its being actually the lightest note in the place simply makes it show least, while *black* here shows most,— *i. e.*, in every upward direction; which means in half of all directions. In addition to all this, even the brightest white relieves *dark* against the brighter parts of the forest floor whenever it is itself in deeper foliage-shadow than this background. (For a fuller analysis of all this see my 'Arraignment' article[1] in the 'Popular Science Monthly' for Dec., 1909.) In other words, white in the woods is the least conspicuous of colors, and black the most so, in as many as three-quarters of all directions. Add to this that in patterns it always helps to 'cut up' the wearer; and remember also the wonderful function shown in Figs. 1, 2, 3 and 4 of the above-named 'Popular Science' article. When a white-wing-patterned bird flashes out his flight-whites, all the concealing-faculties of brilliantly contrasted patterns shown in those illustrations spring into play, *and trebly so because of* motion, when every dark part is as it were chalked over into dimness by each flap of the white-patterned wings. The inevitability of *detection* through motion had made people suppose it was the *patterns* that caused the detection. What they *do* cause is *identification after* detection.

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[1] More accurately, a tangent of a sphere *larger* than the world, and, of course, outside of it.

Monadnock, New Hampshire,
September 1, 1911.

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[1] I shall be delighted to send reprints of this article to all applicants.

NOTES FROM EASTERN ALBERTA.

BY WINTHROP S. BROOKS AND STANLEY COBB.

THE following observations were made between August 15, 1909, and February 1, 1910, within a five mile radius of the northern end of Birch Lake, Alberta (latitude 53° 20″ N., longitude 111° 40′ W.), about 90 miles east of Edmonton, the capital of the province. The altitude here is about 1,800 feet above sea level.

Birch Lake itself is a large body of water, some 20 square miles in area, sending northward a long shallow arm. The country immediately surrounding this northern arm consists of level prairie, the smooth expanse of grass occasionally interspersed with patches of bushes. About a mile and a half north of the lake the topography changes to low, rolling hills, with an increase of the bushy growth and scattered groups of small trees. This area is thickly dotted with shallow sloughs and small lakes of varying sizes; the whole forming an admirable resort for wild fowl and waders.

The waders, however, seemed to leave this region very early. On August 15 when Birch Lake was first visited many varieties of shore birds were seen by hundreds, but on returning on the 19th the numbers were much diminished; thereafter they kept leaving steadily, until by September 1 (when, by the way, the shooting season in Alberta opens on these birds) the great majority had left for the south. Yellowlegs and Pectoral Sandpipers were the only species that remained abundant through September.

The list is obviously limited, but as the observers went into the country purely on a shooting trip, birds other than wild fowl and waders were noted only during spare moments, or when they chanced to be in the writers' paths.

1. **Colymbus holbœlli.** HOLBŒLL'S GREBE.— A few seen Sept. 3.

2. **Colymbus auritus.** HORNED GREBE.— Several noted.

3. **Podilymbus podiceps.** PIED-BILLED GREBE.— Quite common.

4. **Gavia immer.** LOON.— One immature shot, Sept. 15.

5. **Larus delawarensis.** RING-BILLED GULL.— Fairly common on larger bodies of water.

6. **Larus philadelphia.** BONAPARTE'S GULL.— Abundant in a small lake 3 miles north of Birch Lake, whence they flew to the latter every night. Last seen Oct. 13.

7. **Hydrochelidon nigra surinamensis.** BLACK TERN.— Fairly common until the middle of September.

8. **Lophodytes cucullatus.** HOODED MERGANSER.— Several seen Aug. 15 and 19.

9. **Anas platyrhynchos.** MALLARD.— Breeds here. Abundant, staying until lakes were frozen over.

10. **Chaulelasmus streperus.** GADWALL.— Breeds. Fairly common until Sept. 11 when a great flight arrived. Left about Oct. 1.

11. **Mareca americana.** BALDPATE.— Abundant. Apparently breeds here. Last noted on Oct. 9.

12. **Nettion carolinense.** GREEN-WINGED TEAL.— Abundant in sloughs. Breeds. Last noted Oct. 6.

13. **Querquedula discors.** BLUE-WINGED TEAL.— Abundant; breeds. Last noted Oct. 6.

14. **Spatula clypeata.** SHOVELLER.— Abundant; breeds. Left the last of September.

15. **Dafila acuta.** PINTAIL.— Breeds. Common, but less so than the other Anatinæ. Last noted on Sept. 29.

16. **Marila americana.** REDHEAD.— Uncommon, seen only on larger bodies of water.

17. **Marila valisneria.** CANVAS-BACK.— Quite common; breeds.

18. **Marila affinis.** LESSER SCAUP DUCK.— Abundant; breeds. Remained until lakes were frozen over.

19. **Clangula islandica.** BARROW'S GOLDEN-EYE.— Common on larger bodies of water during last of September and first part of October. First seen Sept. 10 when 2 females were shot.

20. **Charitonetta albeola.** BUFFLE-HEAD.— Fairly common; breeds.

21. **Oidemia deglandi.** WHITE-WINGED SCOTER.— Fairly common; apparently breeds.

22. **Erismatura jamaicensis.** RUDDY DUCK.— A few seen.

23. **Chen hyperboreus hyperboreus.** SNOW GOOSE.— Three flocks of from 100 to 300 seen on Oct. 11 and 13.

24. **Branta canadensis canadensis.** CANADA GOOSE.— Quite common, breeds; very few flight birds seen.

25. **Botaurus lentiginosus.** BITTERN.— Common about sloughs.

26. **Ardea herodias herodias.** GREAT BLUE HERON.— One seen on Aug. 22.

27. **Grus americana.** WHOOPING CRANE. — Several flocks of large cranes were seen flying southward, high in the air, and uttering a mellow, rolling call; one of these flocks contained 57. On the night of Sept. 21 there was a heavy migration of these birds, their call being heard at all hours of the night. Positive identification was impossible, but as the birds were very large, and were migrating from the north, it seems reasonably certain that they were Whooping Cranes.

28. **Porzana carolina.** SORA.— Quite common about sloughs.

29. **Fulica americana.** COOT.— Flocks noted on Birch Lake on Aug. 19 and 23.

30. **Steganopus tricolor.** WILSON'S PHALAROPE.— Small flocks seen several times on Birch Lake.

31. **Recurvirostra americana.** AVOCET.— Six seen at Birch Lake Aug. 15.

32. **Gallinago delicata.** WILSON'S SNIPE.— Abundant. Tremendous flight on Aug. 24.

33. **Macrorhamphus griseus griseus.** DOWITCHER.— On Aug. 19 we fired into a flock of ten Dowitchers killing two of this variety, and one Long-billed Dowitcher.

34. **Macrorhamphus griseus scolopaceus.** LONG-BILLED DOWITCHER.— Beside the above record one was shot on Aug. 28.

35. **Micropalama himantopus.** STILT SANDPIPER.— Three seen on August 28 at Birch Lake, two of which were shot. Another was shot on Sept. 6. All were in company with Yellowlegs.

36. **Pisobia maculata.** PECTORAL SANDPIPER.— Common Aug. 28 to Oct. 5.

37. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Common at Birch Lake.

38. **Pisobia minutilla.** LEAST SANDPIPER.— Common at Birch Lake.

39. **Ereunetes pusillus.** SEMIPALMATED SANDPIPER.— Uncommon.

40. **Calidris leucophæa.** SANDERLING.— One shot at Birch Lake, Sept. 6.

41. **Limosa fedoa.** MARBLED GODWIT.— Quite common around Birch Lake in flocks of 4 or 5. Left early in September.

42. **Totanus melanoleucus.** GREATER YELLOWLEGS.— Uncommon.

43. **Totanus flavipes.** YELLOWLEGS.— Very abundant about lakes and sloughs. Last seen on Oct. 5.

44. **Helodromas solitarius cinnamomeus.** WESTERN SOLITARY SANDPIPER.— Common.

45. **Catoptrophorus semipalmatus inornatus.** WESTERN WILLET. — Six seen in all; on Aug. 15 and 19, and Sept. 2.

46. **Bartramia longicauda.** UPLAND PLOVER.— Two seen on Aug. 15.

47. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.— A few seen at Birch Lake during latter part of August. Two specimens taken.

48. **Actitis macularia.** SPOTTED SANDPIPER.— Several noted between August 15 and 30 at Birch Lake.

49. **Squatarola squatarola.** BLACK-BELLIED PLOVER.— Common on the Birch Lake flats.

50. **Charadrius dominicus dominicus.** GOLDEN PLOVER.— A few shot during latter part of August.

51. **Oxyechus vociferus.** KILLDEER.— Not an abundant bird, but a few could always be found.

52. **Ægialitis semipalmata.** SEMIPALMATED PLOVER.— Common at Birch Lake in August.

53. **Arenaria interpres morinella.** RUDDY TURNSTONE.— Twice noted at Birch Lake; one seen on Aug. 25; two seen, one shot, on Aug. 28.

54. **Bonasa umbellus umbelloides.** GRAY RUFFED GROUSE.— A few small flocks were seen in late autumn in the low growth about lakes.

55. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Abundant in small coveys until about Nov. 1, when those in the vicinity formed into two large flocks of from 75 to 100 each.

56. **Cathartes aura septentrionalis.** TURKEY VULTURE.— One seen flying over prairie Sept. 7.

57. **Circus hudsonius.** MARSH HAWK.— Very common. Twice found eating ducks we had shot.

58. **Buteo borealis calurus.** WESTERN RED-TAIL.— One seen Aug. 24.

59. **Buteo swainsoni.** SWAINSON'S HAWK.— This bird and the Marsh Hawk were the typical hawks of the region. Every landscape seemed to contain a Marsh Hawk flapping low over the prairie and a stolid Swainson's sitting on some fence post or hay stack.

60. **Aquila chrysaëtos.** GOLDEN EAGLE.— Two seen late in October.

61. **Falco columbarius columbarius.** PIGEON HAWK.— A few seen in September.

62. **Falco sparverius.** SPARROW HAWK.— Several seen on Aug. 19.

63. **Pandion haliaëtus carolinensis.** OSPREY.— One flying over Birch Lake on Sept. 17.

64. **Asio flammeus.** SHORT-EARED OWL.— Abundant. Could be found around nearly every slough at twilight.

65. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— One seen Oct. 11. Two found poisoned by coyote baits on Nov. 17.

66. **Dryobates villosus leucomelas.** NORTHERN HAIRY WOODPECKER.— One seen Nov. 15.

67. **Colaptes auratus luteus.** NORTHERN FLICKER.— Two noted Sept. 15.

68. **Tyrannus tyrannus.** KINGBIRD.— Common.

69. **Corvus corax principalis.** NORTHERN RAVEN.— One seen every day during week of Nov. 15 to 22.

70. **Corvus brachyrhynchos brachyrhynchos.** CROW.— Abundant; often in tremendous flocks.

71. **Sturnella neglecta.** WESTERN MEADOWLARK.— A few noted.

72. **Icterus spurius.** ORCHARD ORIOLE.— One seen Aug. 19.

73. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Abundant; left about Sept. 20.

74. **Astragalinus tristis.** GOLDFINCH.— A few noted during latter part of August.

75. **Plectrophenax nivalis nivalis.** SNOW BUNTING.— Appeared the first week in November. Abundant.

76. **Calcarius lapponicus lapponicus.** LAPLAND LONGSPUR.— Abundant in large flocks during latter part of September.

77. **Pocecetes gramineus confinis.** Western Vesper Sparrow.— A few seen in August.

78. **Passerculus sandwichensis alaudinus.** Western Savannah Sparrow.— Common on prairie.

79. **Ammodramus savannarum bimaculatus.** Western Grasshopper Sparrow.— Quite common in long grass.

80. **Zonotrichia leucophrys leucophrys.** White-crowned Sparrow.— Several seen Sept. 5.

81. **Spizella monticola ochracea.** Western Tree Sparrow.— Common during first part of October.

82. **Progne subis subis.** Purple Martin.— Quite a number seen flying over Birch Lake on Aug. 25.

83. **Iridoprocne bicolor.** Tree Swallow.— A large number seen with the Purple Martins on Aug. 25.

84. **Bombycilla cedorum.** Cedar Waxwing.— Three observed Aug. 30.

85. **Lanius borealis.** Northern Shrike.— Two seen Oct. 5.

86. **Anthus spraguei.** Sprague's Pipit.— Abundant.

87. **Penthestes atricapillus septentrionalis.** Long-tailed Chickadee.— First seen Oct. 4; common for a few days after this.

88. **Planesticus migratorius propinquus.** Western Robin.— Two seen Aug. 30.

A NOTE ON THE NESTING OF THE WHIP-POOR-WILL.

BY A. DAWES DU BOIS.

The following notes were made in connection with two nests of the Whip-poor-will (*Antrostomus vociferus*) near the village of Bradford, in Sangamon County, Illinois. The first nest was found on May 16, 1908, in a strip of woods of medium size trees, thickly undergrown, on a high bank of the Sangamon River. The ground was well carpeted with dried oak leaves. Our first intimation of Whip-poor-wills in this place was the sudden appearance of an adult bird fluttering along the ground in front of us, apparently with a broken wing. We stopped at once and while my companion stood to mark the place, I followed the bird a short distance. She fluttered along noiselessly, feigning serious injury and leading me away from the nest as rapidly as I could be induced to follow.

A search revealed the nest within a pace of the spot we had marked. It contained one egg and the broken shell of another which gave evidence of having hatched. Although I stooped to examine the broken shell I did not see the bird that had hatched from it until my companion called my attention to it. The little fellow was crouched, motionless, upon the brown leaves not six inches from the broken egg-shell. It was thickly clothed with extremely soft, fluffy down, of uniform yellowish brown which harmonized with the dead oak leaves all about it. A more complete protective coloration would be difficult to imagine. The tubular nostrils have, in the young bird, an exaggerated prominence, and this is perhaps its most striking characteristic.

Although the young nestling was absolutely motionless when discovered, it exhibited no fear upon being taken in hand, and even scrambled toward the source of sound when the writer held it near his face and made a faint clucking noise with his mouth.

There was no indication that the leaves had been arranged by the parent to form a nest; they were merely flattened down somewhat where the brooding bird had been sitting. The nest was situated among a few saplings, with an occasional may-apple growing about the spot, but there seemed to be no special attempt at secreting it. The unhatched egg had the appearance of being fresh but it proved to be infertile.

Having marked the spot we left the woods, curious to know whether or not the parents would remove their young to another place on account of our intrusion. We returned next day and found the parent bird brooding her little offspring not more than three feet from the original nest. She fluttered from the spot as she had done the previous day, but this time uttering a very low hissing or "soughing" sound. It was upon this second day that photographs of the young bird and of the parent were taken. The adult was afraid of the camera and did not return to her young for more than an hour after the camera had been placed. She kept vigilant watch, however, at a short distance, moving about near the ground with a remarkably noiseless flight but uttering a "chip" or "whit" similar to that of a domestic chick. She finally perched on a dead branch a few feet from the young bird and sat there a long time watching the camera. Her calling to the young resulted in its moving several feet toward her, so that the camera had to be re-focused. This was done quietly and as quickly as possible without changing the position of the tripod, and then I left the vicinity entirely. Upon returning some time later to the end of the operating thread, I found the old bird in position for her photograph. It was impossible to distinguish her from her surroundings, at a distance of forty or fifty feet, without the aid of the field glass.

Only one parent was observed during these investigations. Later in the day three other Whip-poor-wills were flushed in the same woods but a search failed to reveal any evidence that they were nesting.

Again on June 15, a Whip-poor-will was flushed in another woods a few miles further south. She feigned injury in the same manner as previously described; I stopped immediately, and upon looking down found two eggs six feet from where I stood. They were deposited on the dead oak leaves as before and were not concealed by underbrush or otherwise. This nest, like the previous one, was on high ground and in dense woods.

I desired to test this bird to see if she would remove the eggs after they had been disturbed and it occurred to me to test the bird's discrimination, at the same time, by substituting a pair of Mourning Dove's eggs for her own. Having found a dove's nest earlier in the day, I secured the eggs and left them in place of the Whip-poor-will's. They were practically the same size,— somewhat smaller,— but the difference in coloration was quite pronounced — the dove's eggs being pure white and the Whip-poor-will's richly marked in their characteristic manner.

Upon returning next day, I stopped thirty feet from the spot at which the eggs had been left. Nothing but leaves could be seen with the unaided eye, and my first thought was that the eggs had been removed, but a look through the field-glass revealed the Whip-poor-will sitting contentedly on the Mourning Dove's eggs, exactly where I had left them the previous day.

ROOSEVELT'S 'REVEALING AND CONCEALING COLORATION IN BIRDS AND MAMMALS.'

BY J. A. ALLEN.

Under this title[1] Mr. Roosevelt presents a critical and extended review of the Messrs. G. H. and Abbott H. Thayer's book entitled 'Concealing-Coloration in the Animal Kingdom,' published early in 1910.[2] In this book, he says: "The doctrine of concealing coloration as an explanation of almost every kind of coloration in the animal kingdom has received its widest application....In its extreme form as stated by these gentlemen, the doctrine seems to me to be pushed to such a fantastic extreme and to include such wild absurdities as to call for the application of common sense thereto. The Messrs. Thayer state their position in the most positive form. Fundamentally it is that, in the first place, all or practically all animals are concealingly colored, and in the next place, that while their patterns in all cases help thus to conceal them the chief factor in their concealment is the counter-gradation of shades, their inconspicuousness being due, not to their color being like that of the surrounding objects, but to this counter-gradation causing them to escape being seen at all. In order to show the sweeping claims made by the Messrs. Thayer, and accepted by their followers, I quote their exact language:" (Here follows a page or more of quotations from their book.)

"Before discussing these positions and the argument advanced on behalf of them by the Messrs. Thayer," continues Mr. Roosevelt, "I wish to call attention to certain arguments of theirs, both in the shape of pictures and in the shape of letter-press, which are really not arguments at all, properly so considered, but are simply misstatements of facts, or wild guesses put forward as facts. I do not for a moment suppose that the misstatements are intentional on the part of the Messrs. Thayer. I believe that they are due to the enthusiasm of a certain type of artistic temperament, an enthusiasm also known to certain types of scientific and business temperaments, and which when it manifests itself in business is as sure to bring the owner into trouble as if he were guilty of deliberate misconduct." He then takes up these alleged misstatements and devotes some ten pages to them, criticising his pictures of the peacock, zebra, chickadee at nesting-hole, oyster-catcher, wood duck, flamingoes, spoonbills and ibises, and the accompanying text; also the "flank-markings" of ducks, the head, bill and leg markings in rapacious birds, and the effect of iridescence in birds.

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[1] Revealing and Concealing Coloration in Birds and Mammals. By Theodore Roosevelt. Bull. Amer. Mus. Nat. Hist., Vol. XXX, pp. 119–231, August 23, 1911. Price, 60 cents. Address, Librarian, American Museum of Natural History.

[2] Noticed in this journal, Vol. XXVII, April, 1910, pp. 222–225.

As an example of the comment on these alleged misstatements we may cite (p. 131): "Again, Mr. Thayer says that the fact that the scarlet tanager's coloration 'divides it into two things, a black and a red thing,' shows that it is not 'meant to be conspicuous' because in that case it would be a 'monocrome.' But the summer red-bird and the cardinal are both monochrome! Mr. Thayer simply forgets this, and forgets that the argument he advances to show that one is inconspicuous, necessarily shows that the two others are conspicuous. As a matter of fact, of course the plumage of all three birds is highly advertising." In the way of general comment, in this connection, he says: "Mr. Thayer's book is for the most part filled with theories predicated upon observations made under conditions which are designedly abnormal. Any practical expert with colors knows that extraordinary effects can be wrought by a proper arrangement of lights and shadows. If seen against the horizon under certain conditions of light, all animals, no matter what their real color, will seem to be of the same color; and no color can be imagined which will not become inconspicuous, whether on an animal or off an animal, if against certain backgrounds."

The principle of countershading, as set forth by Mr. Thayer, is next considered, and admitted as a discovery of real merit, but "although important as a coloristic law, has a very limited application among birds and mammals so far as concealing them is concerned....It does, however, I believe, play a certain small part, in some cases, even with birds and mammals, and possibly a far greater part with lower forms of life; and Mr. Thayer is entitled to full credit for calling attention to this fact. Unfortunately as regards mammals and birds, he has given it a thousand-fold more importance than that to which it is entitled." This, we believe, must be the ultimate conclusion of intelligent field observers of wide experience on serious examination of the facts in the case.

The main contention of Mr. Roosevelt's paper is that concealment in birds and mammals is due mainly to "cover and habits." Birds of many species, living in all kinds of environment, and embracing all the leading types of bird life as regards size, habits, and habitats, and of mammals, from elephants, giraffes, zebras, antelopes, lions, cougars, skunks, marmots, squirrels, field mice, shrews, etc., are discussed at length with reference to Mr. Thayer's points of view. A few excerpts will show the method of treatment adopted by Mr. Roosevelt: "Now as to the insistance Mr. Thayer puts on some of his propositions. When he says that 'the striking patterns' and 'the utmost contrasts of color' on animals 'make wholly for their obliteration,' really the only way of answering him is by a negative. The red-headed woodpecker exactly fulfils Mr. Thayer's description of an animal with such a pattern and contrast of color. If in Mr. Thayer's eyes a red-headed woodpecker in its normal surroundings is inconspicuous there is no more to be said than we would say to a man who asserted that a large house standing alone on the prairie and colored half black and half white, with a bright red roof, was inconspicuous....The red-headed woodpecker is one of the most conspicuous of all animate objects. Its habits are such that even a city-bred man must see this."

"Again, take what Mr. Thayer says of countershading, and of why a protectively colored animal escapes detection. Mr. Thayer insists that the animal escapes observation, not because its colors match its surroundings, or because it sits motionless like a stump, or clod, or some such inanimate thing, but purely because of its shading, which he says is rendered obliterative by the counter-gradation of shades, so that the eye does not recognize it as a solid object of any kind.'...This spring, once or twice after heavy rain I have seen meadow mice in unusually open spots where I could examine them having in view this matter of concealing coloration. When they move they are visible at once; when they are still they always crouch nearly flat — their short legs render this necessary — and there is then practically no effect of countershading; it is a negligible element in concealing them; they are concealed because their dull colors, round contours, and absolute immobility make them look like lumps of mud, or other natural objects so that the eye fails to distinguish them from their surroundings, as one fails to distinguish a muddy tennis ball. On an absolutely flat and bare surface they are seen at once.... Where the color [white] is simply on the belly, it does not advertise the animal, merely because it is not seen; that is, instead of this coloration concealing the animal, the animal conceals the coloration, and it has no effect one way or the other."

The coloration of mammals in respect to their concealing or advertising qualities is discussed at great length (for about 40 pages), special attention being given to the larger species, as the giraffe, zebra, antelopes and deer of many species, and the carnivores, from the point of view of the author's wide personal experience as a field naturalist and hunter, with particular reference to such much-discussed species as the pronghorn, giraffe, zebra, lion, leopard, and cougar. In the course of this discussion he says: "The first, and by far the most important, fact brought home to any competent observer is that as regards the great majority of these animals the question of cover infinitely outweighs the question of coloration in the problem of concealment; this being so true that when there is no adequate cover most of the big animals do not trust to concealment at all, and concealment, whether of coloration or otherwise, plays no part in making their lives successful. Next comes the fact that there are some animals, chiefly cats, whose peculiar physical address in hiding and in stealthy approach and escape is such that their ability in this respect far outweighs the question of coloration, and even the question of cover, provided the cover is in any way adequate. Finally, there are some animals as to which it is possible that the coloration does have a concealing effect of some importance."

"The cougar," with which Mr. Roosevelt has had exceptional experience in its natural haunts, he views as "an interesting beast from every standpoint, including its coloration; and a study of the effect of its coloration from the 'concealing' standpoint is, or ought to be, illuminating, when taken in consideration with much that is written about the concealing quality of the coloration of leopards, tigers and other cats. My experience, in accord with the experience of almost all other hunters and outdoor naturalists, is that the cougar is of all our American big animals the one most difficult to see and most rarely seen. The cougar's neutral-tinted, nearly unicolored, countershaded coat, unquestionably has a concealing quality, in the woods and among clay banks and rocks under ordinary conditions; and for a long time I, in common with most observers, accepted this as the chief element in explaining the way in which the cougar escapes observation. But when I came to think out the matter I realized that in many parts of its range the landscape is in winter snow covered, and that a totally different theory must be invoked for the cougar's invisibility when snow is on the ground." After detailing his experiences with cougars under these conditions he says: "This means that the cougar's coloration was really an insignificant and practically negligible factor in its concealment. The prime factors in keeping the cougar invisible were its nocturnal habits, its caution and wariness, its sharp senses, its wonderful ability to take even advantage of the scantiest cover, and its power of lying indefinitely motionless and of advancing with inconceivably noiseless and crouching stealth....Furthermore the facts in the case of the cougar, an animal big enough to permit us to be certain just what the facts are, enable us to appreciate the real conditions which render it difficult to see so many smaller creatures."

The author presents his 'conclusions' (pp. 212–220) under eleven general statements, which we have not space here even to summarize. The ground is broadly covered, however, in statement 11, which we here transcribe:

"(11) In short, as one might anticipate, when we deal with the coloration of birds and mammals we deal not with any one cause, but with a varied and complex tissue of causes. Forces have been at work to develop concealing coloration in many species, and countervailing forces have worked with greater or less strength to counteract the influence of the first, in some species completely succeeding and in others partially succeeding. Some birds and mammals are so colored that normally or at certain important times their coloration helps to obliterate them from the sight of their foes. Others are so colored that their coloration under all normal conditions and from every viewpoint, and at the most critical periods of their lives, tends to reveal them to their foes. In others the coloration is of little consequence, one way or the other. Birds and mammals living under precisely the same conditions have totally different types of coloration, and display totally different traits and habits when seeking to escape from enemies or to capture prey. No universal laws can be laid down. Tentatively, it is possible to give adherence to the conclusions which I have sketched in loose outline above. We know that many birds and mammals are concealingly colored. It is hard to say, at least in some cases, whether this concealing coloration has been produced by natural selection, or whether, however produced, it has merely then been taken advantage of by the animals, which have conformed their habits thereto, so as to get the utmost benefit from it. In many birds and mammals sexual selection or some similar principle has completely obscured in one sex the workings of the law which tends to produce concealing coloration. In many other birds and mammals both sexes are advertisingly colored, and whatever be the cause that has produced this advertising coloration it is evident that the circumstances of their lives are such, that their habits and traits of mind are such, as to render the question of concealing coloration a negligible element in their development.

"The species of birds and mammals with a complete obliterative, or concealing, or protective, coloration, are few in number compared to those which possess (either all the time, or part of the time, or in one sex for all the time or part of the time) a conspicuous or revealing or advertising coloration, and to those in which the coloration is neither especially advertising nor especially concealing. As regards the great majority of the species, the coloration, whether concealing or not, is of slight importance from the standpoint of jeoparding or preserving the bird's or mammal's life, compared to its cunning, wariness, ferocity, speed, ability to take advantage of cover and other traits and habits, and compared to the character of its surroundings."

In an Appendix of ten pages Mr. Roosevelt takes occasion to reply to Mr. Thayer's criticisms of Roosevelt's 'African Game Trails,' in one of the appendixes to which the author takes exceptions to Mr. Thayer's statements in his 'Concealing-Coloration in the Animal Kingdom,' these strictures being characterized by Mr. Thayer as an "extraordinary tirade." Mr. Thayer's paper appeared in the July issue of the 'Popular Science Monthly,' after Mr. Roosevelt's article was already in type. Both papers are of course controversial and need not be further mentioned in this connection but both should be read by those especially interested in the problems of animal coloration.

In our mention of Mr. Thayer's book, 'Concealing-Coloration in Animals,' published in the April number, 1910, of this magazine (Vol. XXVII, pp. 222–225), the notice was purposely descriptive, from the view-point of the author, and non-critical. At the time it was written there had been time to give it only perfunctory examination, and while certain seemingly extravagant claims were noticed, there was then neither time nor opportunity to take up the work critically, owing to pressure of other duties. It was recognized, however, that to discuss the merits and demerits of the work would require not only a considerable outlay of time but an indefinite and very large amount of space for their presentation. Later it became evident, on further study of the work, that to review it on its merits would require the space of a booklet and a large expenditure of time. It seems therefore opportune that the task has been undertaken by a field naturalist of recognized fitness, through an experience with both large and small game of unequalled extent, amid not only natural but the most diversified surroundings. The tone of Mr. Roosevelt's paper is judicial and fair, personally kind toward Mr. Thayer, but outspoken and emphatic in criticising what he considers errors in his methods and conclusions. He does not lay claim to final judgment on points where it seems to him our knowledge is incomplete, and in such cases frankly says, 'I do not know,' and appeals to naturalist to further investigate doubtful points. He has endeavored to apply "common sense" to evident misstatements and the misapplication or misinterpretation of facts.

When in November, 1896, at a meeting of the American Ornithologists' Union in Cambridge, Massachusetts, Mr. Thayer gave a demonstration of his discovery of the effect of countershading,[1] those who witnessed it were profoundly impressed and somewhat startled by what they witnessed. It was easy to recognize that Mr. Thayer had discovered a hitherto overlooked principle in optics which seemed to explain how the white underparts of terrestrial birds and mammals rendered them protectively colored. If objects like sweet potatoes suspended a few inches above the ground on a green lawn could be rendered invisible by painting their lower surface white, such markings on the ventral surface of animals must, it would seem, tend to their concealment. But when we come to study such animals in life it becomes apparent that their manner of living greatly qualifies its effectiveness for their concealment, especially in short-legged and crouching animals that live on the ground. Later, however, Mr. Thayer extended his experiments to the pattern markings of animals, and with artificially constructed backgrounds, or with favorably chosen natural backgrounds, was able to demonstrate the practical disappearance of animals with color patterns. This was all very striking and very interesting, and very few who witnessed his demonstrations reflected that the effects were produced through artificial environment, and really proved very little as to the effect of color patterns as a means of concealment in living animals in the actual or natural environment of the species. It showed possibilities that might never happen in life, or so rarely as to be negligible as a means of protection at even vital moments in an animal's career. Discovery of the possibility of finding backgrounds that will match the coloration of any or of every bird or mammal *when motionless* does not necessarily have an important bearing on protective coloration in animals, as has been well-shown in Mr. Roosevelt's illuminating paper. It is here that Mr. Thayer has been misled in his later investigations, as shown in his book on Animal Coloration and in his later papers in reply to his critics. This is unfortunate and to be greatly regretted, for only personal friendship has deterred many of his friends who differ from his conclusions and believe his methods of proof are seriously defective, from openly assuming the rôle of critic. For him to say he is misunderstood by his critics, and that they do not agree with him because they do not understand the 'laws of optics,' is a lame defense for the misconceptions with which his book and recent papers abound.

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[1] See Auk, XIV, 1896, pp. 85, 86.

In an article by Mr. Thayer printed in the present number of this magazine (*antea*, pp. 460–464) we get perhaps a clearer view of what he *now* claims for his investigations than can be obtained from his book and previous papers. He says (*l. c.*, p. 463): "The oft-repeated objection that the wearers of these costumes perpetually reveal themselves by motion, and that consequently my tests give a wrong impression, is just what shows lack of taking in what my investigation is. My whole assertion is that the *costumes* of these creatures are not what reveal them, and the objector's repeated declaration that the real animal moves and shows himself simply backs me up. The use of motionless stuffed skins is the pure method of studying the effect of the patterns *apart* from that of motion....The inevitability of *detection* through motion has made people suppose it was the *patterns* that caused the detection. What they *do* cause is *identification after* detection."

If animals with conspicuous patterns and contrasting colors were always *motionless*, and always chose for resting places backgrounds that match their patterns and conspicuous colors, Mr. Thayer's experiments with stuffed skins and carefully chosen or artificially prepared backgrounds would have some direct bearing on the question of the effect of such patterns and conspicuous and contrasting colors. But since an animal or bird however colored is apt to remain unseen if motionless, especially if physically screened in the least degree, and since most conspicuously colored animals invariably pass a large part of their time in the open and in motion, without the aid of any matching backgrounds, but exposed to an ever varying background, the utility of Mr. Thayer's "pure method of studying the effect of the patterns apart from that of motion" does not seem very evident, a point repeatedly urged by Mr. Roosevelt in the paper here under review.

GENERAL NOTES.

The Dovekie in Maine in Summer.— On July 15, 1911, while Mr. G. Gilbert Pearson and the writer were taking passage, with a local fisherman, from Machias Seal Island, which is about twelve miles south from Cutler, Maine, when about half way between the Seal Island and Cross Island, Me., or about six miles from either point, we came upon a pair of Dovekies (*Alle alle*) swimming in close company. We found them in one of the eddies of the numerous tide rips, caused by the tidal currents of the Bay of Fundy.

They proved to be a male and female in an interesting stage of plumage. The head, neck, underparts, interscapular region, and tertials of the male were of the nuptial plumage, the neck entirely around being uniformly velvety, sooty brown. The rump and tail were of the winter plumage, faded grayish, and worn. The wings were much worn, some of the primaries with bare shafts for half their length.

The female was similar, except that the winter plumage remained over the entire back behind (caudad) the scapular region; the rectrices had been renewed. The throat and sides of the neck, at the place of the winter half-collar of white, were well sprinkled with white.

Though two leading manuals make no distinction between the sexes, this last feature had the appearance of a sex character, and the female was noticeably smaller than the male.

Though the birds were in fair bodily condition and had not been crippled they showed no indication of breeding, and it is doubtful if they could have flown.

I am told by Capt. Merton Tolman, until recently keeper of Matinicus Rock light station, a man whose word in such a matter is not to be doubted, that during the summer of 1910, one of these birds was frequently seen near Matinicus Rock.

So far as known to me, these are the only instances recorded, of the verified occurrence of the bird in summer south of Newfoundland. (*Cf.* Townsend and Allen, Proc. Boston Soc. N. H., XXXIII, p. 309.)— ARTHUR H. NORTON, *Portland, Me.*

The Greater Shearwater on the Coast of Georgia.— On June 11, 1911, I found a dead bird on the beach at Tybee in an advanced state of decomposition. The head only was saved and has been identified by Prof. W. W. Cooke as the Greater Shearwater (*Puffinus major*). As this is the first record of the species in this State he suggests my sending the record for publication in 'The Auk.'

It may be of interest, too, to note a second breeding record of the Savannah Sparrow on Tybee Island. The locality was about half a mile from the nest recorded last year (Auk, XXVII, p. 458), and, as in that case, contained nearly fledged young. It would not have been discovered but for the twittering of the nestlings when being fed by the parent bird. The nest was merely a few straws in a depression of the ground in the middle of a large tuft of " bunch grass."— W. J. Hoxie, *Savannah, Ga.*

Pomarine Jaeger Capturing a Phalarope.— An interesting account of a Pomarine Jaeger capturing and devouring a Phalarope has just been presented to me by a friend, Mr. Allan Moses of Grand Manan, N. B. Mr. Moses and his family for three generations have been taxidermists and students of ornithology and I have always found their observations accurate and their accounts reliable. Mr. Moses was fishing several miles off shore at the time and apparently there were numerous Northern Phalaropes in the vicinity. He writes: " I saw something last Friday that I never saw or knew anything about before. I saw a Pomarine Jaeger catch a phalarope. There was a pair of the jaegers. The female started after the phalaropes and chased them a long time. They were too smart for her, and after a long chase, she separated out one, and then the male gave chase, and in a few minutes with the two chasing the little fellow, one caught him within a hundred yards of the vessel; then they both lighted in the water and ate him."

This letter was dated May 31, and " last Friday " would be the twenty-sixth, making the date of the observation, May 26, 1911.— Albert W. Tuttle, *Boston, Mass.*

Egrets (*Herodias egretta*) **in Massachusetts.**— On August 9, 1911, I secured an Egret from a flock of six on the Eastham Marshes of Cape Cod. The birds had been feeding far out on the open mud flats, but luckily for me approached some " hummocks " of grass behind which I was able to stalk them. Mr. Matthew Luce, who has a house commanding a fine view of the marsh, had been seeing them intermittently since about July 21, and on several occasions approached within a few yards of them. Walter Nickerson, the game warden, had also been watching them and said they always roosted together in a certain tree at a nearby Night Heron colony.— Stanley Cobb, *Milton, Mass.*

The Egret in Plymouth County, Mass.— On July 27, 1911, I saw two Egrets (*Herodias egretta*) in the salt marsh near the mouth of North River, which is the boundary between the towns of Marshfield and Scituate on the south shore of Massachusetts. They were catching fish, and permitted a fairly near approach. Neither had plumes. They were still at North River on August 6.

On July 30 I saw an Egret in the southern part of the town of Plymouth. This bird was catching frogs and fish at a small pond but a short distance from farm buildings. When I startled him, he flew up into a hillside pasture close by. The tall white wader presented a striking and unique appearance as he stood up "straight as a major" in the huckleberry bushes on the hot sunny hillside. He was quite fearless and soon flew down to resume feeding in the ditch of a near-by cranberry bog.

On July 22 Mr. F. D. Lyon of Halifax saw at a pond-bottom in his town another Egret which, like the three birds already noted, was plumeless.

Thus within 10 days four Egrets were noted in Plymouth County, at points rather widely separated, the North River being over 25 miles from the South Plymouth pond and over 12 miles from the Halifax pond-bottom, while this latter point is over 20 miles from the south Plymouth locality. Halifax lies eight miles inland; the South Plymouth pond is within two or three miles of the sea.

I am informed on good authority that an Egret was seen about 10 years ago at North River. Mr. Thomas W. Graves of Plymouth tells me that he also saw an Egret at Yarmouth on Cape Cod a number of years ago. This bird had the plumes.— J. A. Farley, *Plymouth, Mass.*

The Egret at Marshfield, Massachusetts.— The town of Marshfield is situated about thirty miles southeast of Boston bordering on Massachusetts Bay. There is a considerable stretch of salt marshes with a number of small ponds or pools scattered here and there. It is an ideal place for water birds.

On July 30, 1911, in company with Mr. Joseph A. Hagar of Marshfield and Mr. Harold D. Mitchell of Newtonville, I observed a pair of Egrets (*Herodias egretta*) feeding in one of the numerous pools on the marshes at Marshfield. We first saw them from a hill about three-quarters of a mile away. Under the cover of bushes and stone-walls we approached to within about four hundred feet, then, at times crawling flat on our stomachs, Mr. Hagar and I gained the shelter of a blind, not over two hundred feet away from the birds.

With the Egrets was a Great Blue Heron (*Ardea herodias herodias*) which remained perfectly motionless on the bank, while the others were nervously moving about. Comparing them with the Blue Heron, they appeared to be rather smaller; in form similar, but more slender, especially the neck. The entire plumage was pure white, the bill bright yellow, and the legs and feet black. When they saw that they were observed they became very restless and shy and kept walking up and down the bank with quick, graceful steps. One was always on watch while the other was preening its plumage or catching fish. Several times they ran quickly towards each other and with outstretched wings, and in a rather ludicrous manner, bobbed, bowed and touched their bills together. At this time we thought that we saw two or three "aigrette" plumes on the back of one of the Egrets, but of this we were not certain. They were altogether silent while we were near.

Their movements and flight were more graceful and agile than those of the Blue Heron and their snow-white plumage showed up very plainly against the dark background. We observed the Egrets for over an hour and have no doubt of their identification. They were *not* albino Blue Herons.

After I had returned home to Jamaica Plain, Mr. Hagar wrote me a letter, dated August 13, from which I take the following: "Two days later, on August 14, I was fortunate enough to approach them (the Egrets) within one hundred and thirty feet by actual measurement, first on foot and then in a ducking boat. This time they were feeding along the bank of the river and were much less wild. The night of August 1 they changed their feeding grounds to the Scituate side of North River, about five miles north of where we first saw them. They were reported by various persons for almost a week before I saw them again. They were usually seen feeding on the marshes or perched in some large dead tree along the edge of the marsh. On August 5 I saw them late in the afternoon and for the first time heard their note, a harsh guttural 'squawk,' not unlike the note of the Black-crowned Night Heron (*Nycticorax nycticorax nævius*).

"On August 8, while out in a dense fog on the marshes, I heard a hoarse squawk and looking up, saw the Egrets directly overhead. That day either they parted company or one was shot, for the next morning one was seen on the marshes and another (or perhaps the same one, in the former case) on the shore of a little pond seven or eight miles back from the coast. The next night they disappeared, nor have I heard of them since."

The 24th of July a local gunner told Mr. Hagar that a few days previously he had seen a pair of "White Herons" with several Great Blue Herons near the mouth of the North and South Rivers in Scituate. This would indicate that the Egrets had been in the vicinity for about a month at least.

From the 'Birds of Massachusetts,' by Howe and Allen (1901), page 45: "*Ardea egretta*. American Egret. An occasional summer visitant. Records from: Ashland, Dedham, Hudson, Ipswich, Lynn, Nantucket, North Hadley, Plymouth, Quincy, Springfield, Topsfield, Wellesley, West Brookfield, and Westford. Last record: Nantucket, one taken Sept. 23, 1890 (Auk, Vol. VII, Jan., 1891). Apr., May, Aug., Sept., Nov."

Marshfield is a new town and July a new month for their appearance, and 1890 is the latest year that I find any authentic record of Egrets in Massachusetts.— Harold L. Barrett, *Jamaica Plain, Mass.*

The Black-bellied Plover in Center County, Pa.— The rarity of the Black-bellied Plover in the interior counties of Pennsylvania makes it desirable to place on record the capture of a specimen near State College, Pa., on Sept. 3, 1909. At the time of its capture the bird was in company with a small flock of Killdeers on a small hillside above a swamp. The bird is a young male and is at present in the collection of the writer.— Richard C. Harlow, *State College, Pa.*

Rough-legged Hawk (*Archibuteo lagopus sancti-johannis*).— On March 25, 1911, while on Protection Island, Straits of Juan de Fuca, I picked up a dead bird of this species that had been shot by some gunner. It had not been killed more than a few days and was apparently an adult male in the light phase of plumage but was too much decomposed to prepare.— S. F. RATHBUN, *Seattle, Wash.*

Buteo platypterus Eating Minnows.— The intense and prolonged dry spell has dried, among others, the creek Rio Seco on the San Carlos estate; water being found only in two or three shallow puddles 6 or 8 feet long by half as broad and 4 inches deep, at deepest. These puddles were alive with small minnows known locally as " Guayacones."

On April 9, 1911, I shot from a tree near one of these puddles a female Broad-winged Hawk (*Buteo platypterus*). Upon examining her crop I was surprised to find 16 whole minnows from ½ to 1½ inches long, which she had just eaten. Unfortunately I did not witness the fishing process.— CHAS. T. RAMSDEN, *Guantanamo, Cuba.*

The Black-billed Cuckoo (*Coccyzus erythrophthalmus*) **Breeding on the Coast of South Carolina.**— On May 10, 1911, while in company with Mr. J. H. Riley, who had come to South Carolina with Dr. Edgar A. Mearns and Mr. Edward J. Brown to collect topotypes of birds for the Smithsonian Institution, I took an adult female *Coccyzus erythrophthalmus*, which was the first specimen I had ever seen alive. Upon examining the bird I found the lower breast and abdomen completely denuded of feathers showing that incubation was going on, but although we searched the swamp carefully for the nest we were unable to find it.

On May 12 I again visited the swamp, accompanied by a colored boy, and shot another female within one hundred yards of the spot where the first bird was taken. This bird had the lower breast and abdomen bare showing that it was incubating, and dissection proved, in both cases, that all the eggs had been laid.

Dr. Mearns accompanied me to the swamp on May 13 with the intention of hunting the greater portion of the forest critically for the nests, as well as to secure other birds of this species, but although we took two specimens of *C. americanus* we were unsuccessful in finding the other species, or its nest. The bodies of both specimens of *erythrophthalmus* are in the Smithsonian Institution, and the skins are in my collection.

Mr. Gilbert R. Rossignol, Jr., of Savannah, Georgia, writes me that Mr. F. N. Irving (also of Savannah) took a specimen of *C. erythrophthalmus* at Sand Island, Beaufort County, S. C., on April 23, 1911, which is now in my collection; also a specimen from Savannah taken April 9, 1911, by Mr. Rossignol, both of which he kindly presented to me. The capture of the two females of *Coccyzus erythrophthalmus*, by the writer near Mount Pleasant, makes the first authentic breeding record for the State.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Northern Flicker (*Colaptes auratus luteus*) **in San Juan County, Wash.**— A typical specimen, an adult male, was taken Oct. 15, 1907, on Orcas Island, in San Juan County, Wash., one of the islands of the San Juan group in Puget Sound. It was brought me and the skin was forwarded to Washington, D. C., for further identification, and pronounced as above.— S. F. Rathbun, *Seattle, Wash.*

Numbers of the Meadowlark still Increasing in Maine.— In this part of Maine, at least, there continues to be an increase in the numbers of the Meadowlark (*Sturnella magna magna*). On Oct. 12, 1910, I found near Winnock's Neck, Scarboro, many more Meadowlarks than I had ever seen in one day before. Flock after flock was flushed, as I walked over the marshes, and there could not have been less than two hundred birds. This is a remarkable number in the case of a species which was uncommon a few years ago and was once a rarity.[1]

About fifty Meadowlarks remained near Pine Point railroad station until late in November, 1910; but only about twenty passed the entire winter of 1910–1911 near here,— fewer than stayed through the previous winter.[2] — F. S. Walker, *Pine Point, Maine.*

The English Sparrow at Tucson, Arizona.— The popular side of bird life is to anathematize the so-called English Sparrow. If it has a known virtue it is kept sedulously in the background, but inasmuch as the complaint is general it is barely possible that they are entitled to the total sum of badness heaped against them, but the rule is rare that has no exception. The English Sparrow (*Passer domesticus*) was first noticed in Tucson about seven or eight years ago. But where they came from, and how they came the writer does not know, but he does know that they did not come in from the west. They breed continuously from early spring to late midsummer. March 23 the writer saw young birds as large as their parents and to the writer's knowledge they are still (July 12) breeding. Nest-making appears to be going on much of the time, both male and females being engaged in the work, but the number of times they breed the writer has no means of knowing. One curious phase of the business is their scarcity in winter. In summer they are so numerous as to be seldom out of sight, but in the winter a drive over the town will not discover a half dozen. In Tucson it rarely snows, but if such thing should happen it instantly melts on touching the ground. Occasionally when a cold wind blows from the mountains freezing point will be reached, but seldom more. Cold weather can therefore be no motive for their scarcity. It is possible they scatter over the desert, but I am much in the country and do not often see them. April 16 last, the writer saw one, a male, at Oracle, a small town in the western foothills of the Santa Catalina Mountains,

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[1] Norton, Auk, XXVI, pp. 307, 308.

[2] Auk, XXVII, p. 341.

40 miles north of Tucson. Undoubtedly there were others, but they were not noticed, and none were seen along the road. In the immediate vicinity of the town a few can occasionally be seen, but not one in ten in proportion to the other sparrows. Word has been received here that they have reached the Colorado, 250 miles west of here, but the report lacks confirmation by authority. Most certainly they were not there four years ago.

The almost universal complaint that they drive away other birds will not hold good hereabouts. During the past four years, while under the observation of the writer, but two disagreements have been noted and in each case it was among themselves. In no single instance has trouble with native birds been seen, although the town is full of them. The Inca Dove is a common resident at all times, and during the so-called winter months are more common on the streets than the English Sparrow. There is scarcely an hour in the day when one or more of them cannot be heard calling in the trees, but never on the ground. Frequently during the early spring mornings, a number of them will be calling at the same time and each one apparently angry with the other. The Mexicans interpret the call as "Pobre Cruz, pobre Cruz," *Poor cross, poor cross*, and because of this apparently reverential sentiment they are frequently used as cage birds. They nest in the town and are much more demonstrative so far as noise is concerned than all the sparrows in the country. The House Finch is likewise a common resident and breeds by the score within the limits of the town. Occasionally I have seen them feeding with the sparrows without interference in either direction. Bullock's and Hooded Orioles, Arkansas Flycatchers, Phainopeplas, Vermilion Flycatchers, Wrens and two species of Hummingbirds are known to nest in the town, and almost every other kind of bird in the country can occasionally be heard or seen in the trees. Twice the writer saw a female Bullock's Oriole scatter a bunch of sparrows that were feeding on the street. Each time it struck and knocked over a sparrow in the center of the bunch, and on each occasion the sparrows were, or appeared to be, badly frightened. Probably there had been previous attacks as my attention was called to the matter by the outcries of the sparrows. I do not know what had been done to incur the fighting displeasure of lady Oriole, but instead of resenting the insult they flew into a tree on one side of the street and the Oriole returned to her tree on the opposite side. On another occasion I saw a young male Cowbird busy with a piece of bread in the street. It was soon joined by a female English Sparrow which seemed anxious to get a share of the bread, but did not venture the attempt. It hopped entirely around the diner at a distance of about two feet, although the other bird paid no attention to it. Although I am frequently in the University grounds, about a mile from the business center of the town, I have thus far not seen one of the objectional sparrows, but the other birds of the country are there in great numbers. The same can be said of the Santa Cruz Valley, a portion of which is covered by the residential portion of the town. Throughout the winter months the vacant weed-growing lots about town are patronized by hundreds of sparrows. Gambel's, White-crowned and Chipping Sparrows make up the numerous small flocks, but so far as I know I have never seen an English Sparrow among them.— HERBERT BROWN, *Tucson, Arizona.*

White-crowned Sparrow in Cuba.— I beg to report having secured on March 22, 1911, a female White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*) on the San Carlos estate at Guantanamo. The bird was in fine plumage and not at all shy. This seems interesting to me, as Dr. Gundlach in his long experience on this island never met this species.— CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

The Scarlet Tanager (*Piranga erythromelas*) **on the Coast of South Carolina.**— On April 16, 1911, Mr. J. H. Riley observed, while *en route* to my house, accompanied by Dr. Mearns and Mr. E. J. Brown, a male of this exquisite bird about five miles from Mount Pleasant, and on May 4 I secured a superb male while in company with Dr. Mearns. During all the years I have spent observing birds on the coast this specimen makes the third that I have seen, the migration being more than one hundred miles away from the coast, as it is known to be rare a few miles south of Columbia.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Rare Swallows in Georgia.— It is with pleasure that I report the capture of two Bank Swallows (*Riparia riparia*) on Sept. 1, 1911. This being the second record for the State.

On Aug. 20, 1911, I saw three Cliff Swallows (*Petrochelidon lunifrons*) on a telephone wire and to-day (Sept. 1) Mr. W. J. Hoxie observed 10 or 12 flying about in a vacant lot in the city of Savannah. The Cliff Swallow is a rare migrant here.— G. R. ROSSIGNOL, JR., *Savannah, Ga.*

A Peculiar Variation in the Louisiana Water-Thrush (*Seiurus motacilla*).— Of an adult female taken by the writer on March 29, 1911, near Mount Pleasant, the outermost rectrices on each side are narrowly tipped with white on the inner webs, while the next rectrix, as well as its fellow, is broadly blotched with white; the third pair have a streak of white extending along the shaft. Mr. W. F. McAtee has recorded[1] a similar case in *Seiurus noveboracensis notabilis.*

In almost all the spring specimens that I have taken in South Carolina there is a *conspicuous* median stripe of buffy white on the pileum extending past the eye. This median stripe is also present in autumnal specimens, but concealed, and its conspicuousness in spring examples is due to the wearing away of the tips of the feathers of the pileum, as there is no spring moult in this species. The presence of this median stripe is not mentioned by Mr. Ridgway.[2]— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

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[1] Auk, Vol. XXI, 1904, pp. 488, 489.

[2] Birds of North and Middle America, Part II, 1902, p. 639.

Nests of the San Nicolas Rock Wren.— On June 24, 1911, I secured a set of four very badly incubated eggs of the San Nicolas Rock Wren (*Salpinctes obsoletus pulverius*). The nest was made of grass, upon a base of flakes of sandstone; the latter laid in the bottom of the nest cavity and the grass nest proper built upon them. The nest cavity was seven feet up, in the side of an immense boulder that had fallen from the cliff above the cañon-side upon which the boulder lay. The nest was visible from the ground, and was very similar to that of the House Finch (*Carpodacus mexicanus frontalis*); in fact I nearly passed it by for that reason.

This is the second nest of this wren that I have examined. The first (recorded in 'The Condor') was situated under the eaves of a store-house within fifty feet of the ranch house, and contained four young birds, June 21, 1911. The parent birds and young were observed returning to the nest each night and leaving every morning, after the young were fully fledged and well grown. This nest was the counterpart of the other; grass, upon a base of small flakes of sandstone.—C. B. LINTON, *Long Beach, Calif.*

The Bewick's Wren in Center Co., Pa.— A fine male Bewick's Wren was observed about three miles south of State College, Pa., on April 24, 1910. The bird was not at all wary and the perfect identification made the collecting of the specimen unnecessary. The Bewick's Wren is an extremely rare visitor in Center County, though further to the westward in the State it is of more regular occurrence.— RICHARD C. HARLOW, *State College, Pa.*

Wood Thrush at Newbury, Vt.— I have spent my summers since 1905, from June to October, in the town of Newbury, Vt., on the Connecticut River, five miles south of Wells River, and twenty summers previous at Lake Willoughby, Vt. Before 1910 I had never identified a Wood Thrush at Newbury, though the Wilson and Hermit Thrushes were quite common. During the summer of 1910 two Wood Thrushes were identified in the same part of the town where the other thrushes were found.

This year, 1911, there is a noticeable increase of Wood Thrushes. I have seen them in both localities and should say they were from 6 to 8 birds singing where last year only two were identified.

In the late afternoon, of July 1 there was a fine concert by the Wood, Wilson, and Hermit Thrushes in one locality, with a specially fine performance by the Wood Thrush.— ANNA E. COBB, *Newbury, Vt.*

Note on Two Unrecognized Forms of North American Birds.— Jamaica, or at least the West Indies, is supposed to be the type locality of *Melopelia asiatica* (Linnæus). Comparison shows that the bird from the southwestern United States and northern Mexico is slightly larger, with a much longer bill and much paler coloration than the West Indian bird.

Therefore, in the 'A. O. U. Check-list,' the White-winged Dove of the United States should stand as *Melopelia asiatica trudeaui* (Audubon).[1] Type locality, " Texas."

It also seems desirable to recognize a pallid western form of the Mourning Dove, ranging from the Pacific Ocean and San Clemente Island eastward across the United States and northern Mexico to the Mississippi Valley, as *Zenaidura macroura marginella* (Woodhouse).[2] Type locality, "the cross timbers, on the north fork of the Canadian River, Oklahoma. — EDGAR A. MEARNS, *U. S. National Museum, Washington, D. C.*

Lark Bunting in New Brunswick.— August 15, 1910, a young male Lark Bunting (*Calamospiza melanocorys*) was shot by Allen J. Moses at Nantucket, a small island near Grand Manan, New Brunswick. The bird was determined by Dr. Glover M. Allen of the Boston Society of Natural History who stated that this was only the fourth record of this species in the East, the others being from Massachusetts, Long Island and South Carolina.— ELIZABETH M. DUNHAM, *Auburndale, Mass.*

Some New Birds for Colorado. BLACK-THROATED GREEN WARBLER (*Dendroica virens*).— Adult female taken by the writer at Barr Lake, Colo., May 20, 1909.

BUFF-BREASTED SANDPIPER (*Tryngites subruficollis*).— Two taken by the writer at Barr Lake Aug. 25 and Sept. 4, 1910, out of flocks of 3 and 5 respectively. This Sandpiper is one Professor Cooke had previously predicted would some day be taken in Colorado.

MOTTLED DUCK (*Anas fulvigula maculosa*).— This bird was taken by Mr. W. N. W. Blayney near Loveland, Colo., in 1907. It is a beautiful male bird in fine plumage. It was identified by Mr. H. C. Oberholser, also by Prof. Wells W. Cooke who writes me this is the first sure record of *maculosa* for Colorado.

All three of these species are in the Colorado Museum of Natural History. — L. J. HERSEY, *Curator of Ornithology, Colorado Museum of Natural History, Denver, Col.*

Notes on Rare Species in Eastern Missouri.— On July 2, 3 and 4, 1911, I took a canoe trip down the Meramec River from Steelville in Crawford County to Moselle in Franklin County,— Steelville being about eighty miles and Moselle about forty miles southwest of St. Louis. The Ozark border region, through which the narrow and rapid stream flows, is heavily wooded and hilly. Limestone cliffs, 100 to 250 feet in height, rise sheer from the river at many points. The region is but very rarely visited by any observer with an eye for birds, and it yielded, in a list of seventy-odd species, the following interesting notes:

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[1] Birds of America, VII, 1844, p. 352, pl. 496.

[2] Proc. Acad. Nat. Sci., Philadelphia, 1852, p. 104.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).— July 3 in Crawford Co., on the banks of the Meramec River, about sixty miles southwest of St. Louis, a male Yellow-headed Blackbird in full plumage and song. I was unable to locate others of the species, although inquiry among farmers nearby elicited the information that a dozen pairs or so had been seen regularly at that particular place for the past six or seven years. They stated the birds always disappeared early in July. They were well enough known to have the local name of "Indian Blackbird."

There is no previous record of Yellow-headed Blackbirds in the breeding season so far east in Missouri.

Duck Hawk (*Falco peregrinus anatum*).— July 3 in Crawford County on the banks of the Meramec River, one splendid specimen of a Duck Hawk, which followed our canoe for a quarter of a mile, screaming and swooping, and occasionally alighting on dead trees on the rim of the limestone cliffs, 200 feet above us. It is probable that there was a nest at some point along the cliff, though a careful search with the glass failed to locate it.

Duck Hawks are decided rarities now in Missouri. Dr. Otto Widmann states that a few pairs used to breed along the Mississippi and Missouri Rivers up until the early 90's, but none has been seen since. He says (Birds of Missouri, 1907): "There may be still a few pairs nesting in out-of-the-way places in the Ozarks." This observation confirms that opinion.

Egret (*Herodias egretta*).— July 3 on the Meramec in Crawford County, a pair of Egrets in perfect plumage, both of which flew up from the shore into a dead tree and remained in full view for three or four minutes as our canoe glided by them.

Inquiry of the men along the river, engaged in floating tie-rafts to points on the railroad, brought out the information that "White Cranes" are seen occasionally along the upper reaches of the river,— sometimes two or three times a year, but usually once in every three or four years.

Egrets used to breed not uncommonly in eastern central Missouri, but none have been noted in former breeding places since 1900. (Widmann, Birds of Missouri.)

Blue-winged Teal (*Querquedula discors*).— July 2, 3 and 4 on the Meramec River at four different points in Crawford and Franklin Counties, four Blue-winged Teal,— a pair and two single individuals; also noted several of the species on this river in Franklin County early in September, 1910. Blue-wings have become very rare during the breeding season in Missouri. The last record (Widmann) is June 17, 1906.

Northern Pileated Woodpecker (*Phlœotomus pileatus abieticola*).— One male in Franklin Co., about fifty miles from St. Louis, on July 4, in oak woods along the Meramec River. The Pileated has become very rare in central eastern Missouri during the last twenty or thirty years. Rivermen along the upper Meramec report seeing it occasionally.— ROGER N. BALDWIN, *St. Louis, Mo.*

New Greenland Records.— My attention was lately directed to a European pamphlet entitled ' Dansk Ornithol. Foren Tidskrift,' IV, p. 130, where by an author, O. Helms, under the caption ' Nye Arter for Östgrönland,' four species are enumerated as having been taken in East Greenland. Two of them, *Marila marila* and *Falco peregrinus*, are known to have been taken there in previous years. The other two, *Podiceps griseigena* and *Totanus calidris* are new to the A. O. U. Check-List. Although *Totanus calidris* had been added in the past *ex hypothesi*, it is not as yet in the List proper. I propose that they be added to the Check-List, the first after *Colymbus holbœllii* (2.1), the second as *Totanus totanus* (255.1).— W. F. HENNINGER, *New Bremen, Ohio.*

Notes on Birds of Seattle, Washington.— Although the Oregon Jay (*Perisoreus obscurus obscurus*) is a not uncommon species in this locality from October until April, and quite often observed during the breeding season, there is no record to my knowledge of its eggs having been taken in this State, although D. E. Brown, of Seattle, states that a few years ago he found a nest containing young.

On April 18, 1909, the writer while looking through a dense strip of second growth of young red firs (*Pseudotsuga mucronata*) in a heavy wooded tract a few miles east of the city, found a nest of this species. The young fir in which it was built was alongside an old and seldom used path through the second growth, on the edge of a small open space about ten feet in diameter, having a further undergrowth of salal (*Gualtheria shallon*) and red huckleberry (*Vaccinium parvifolium*) shrubs. The tree was five inches in diameter tapering to a height of thirty-five feet, and the nest was placed close against its trunk on four small branches, at a height of twelve feet. It was outwardly constructed of dead dry twigs, next a thick felting of green moss into which was interwoven some white cotton string, and was lined with dry moss, a little dead grass and a few feathers, among the latter some of the Steller's Jay, and is a handsome compact affair. Dimensions: average outside diameter 6½ inches, inside diameter 3½ inches; depth outside, 5 inches; inside 2 inches.

The eggs, three in number, were perfectly fresh, of a grayish cast and rather profusely covered with fine specks and spots of a grayish brown and dark brown color, mostly distributed on the larger ends. Measurements are: 1.01 × .77 inch; 1.05 × .76 inch; 1.03 × .76 inch.

From observation of this species a larger number of individuals may breed in this immediate locality than is generally supposed, but as it is a shy retiring bird during the nesting season, restricting itself to the dense timbered districts, its nest no doubt will remain hard to locate.

The following additional species have been noted since the publication in 'The Auk' (Vol. XIX, No. 2, April, 1902, pp. 131–141) of the 'List of Land Birds of Seattle' and can therefore be added thereto. The numbers are a continuation of the original List.

113. **Melopelia asiatica.** White-winged Dove.— One specimen, now in my collection, a female taken Nov. 11, 1907, at Puyallup, Wash., 25 miles south of Seattle, by J. H. Bowles of Tacoma. This may be regarded as accidental and is so noted in the A. O. U. Check-List.

114. **Accipiter cooperi.** Cooper's Hawk.— Rare summer resident. Breeds. Observed a number of times: August, 1908, May 22, 1909, May 7, 1911.

115. **Astur atricapillus striatulus.** Western Goshawk.— Rare. Have a fine specimen, an adult male, taken east of the city, April 27, 1909.

116. **Strix occidentalis caurina.** Northern Spotted Owl.– Probably not uncommon, but owing to the extent and density of our forests is hard of observation. An adult female in my collection bears date of Oct. 27, 1907, taken near Seattle.

117. **Loxia leucoptera.** White-winged Crossbill.— Numbers of this species, associating with *L. curvirostra minor*, were observed in the vicinity of this city from December, 1908, until the following April (1909), but although carefully watched for since, I have been unable to get other records. Must be regarded as an irregular winter visitant.

118. **Junco hyemalis hyemalis.** Slate-colored Junco.— On Feb. 4, 1909, J. H. Bowles of Tacoma took an adult male of this species which he kindly presented to me.

119. **Melospiza lincolni striata.** Forbush's Sparrow.— An adult male, taken near Tacoma April 14, 1908, by J. H. Bowles is the only record of the species for this immediate vicinity.

120. **Passerella iliaca fuliginosa.** Sooty Fox Sparrow.— One specimen, an adult male, taken by J. H. Bowles April 2, 1909, in Tacoma.

121. **Passerella iliaca insularis.** Kadiak Fox Sparrow.— An adult female taken by J. H. Bowles, Feb. 13, 1909, near Seattle (Kirkland, Wash.).

Undoubtedly this and the preceding species occur irregularly during the spring and fall migrations and may be winter residents to some extent, and there is a possibility that *fuliginosa* may breed in this district as it is known to do so along the coast of N. W. Washington.

122. **Tachycineta thalassina lepida.** Northern Violet-green Swallow.— Was inadvertently omitted from the original list. An abundant summer resident, in and about the city, breeding everywhere in suitable locations.

123. **Bombycilla garrula.** Bohemian Waxwing.— On the morning of Dec. 4, 1910, a most beautiful Bohemian Waxwing in high plumage was observed feeding on the berries of a mountain ash tree in my front yard. This bird remained on the premises until 5 p. m., but returned the following day at 7:45 a. m. and stayed continuously in the yard until

4:30 P. M. The following day it again returned about noon, remaining until dusk. As the mountain ash trees were likewise occupied by upwards of a hundred Western Robins, also feeding on the berries, the supply became exhausted and all the birds left. The Waxwing was entirely unsuspicious, allowing me to approach within three feet, and even then showed no signs of alarm, thus giving an exceptional opportunity for observation.

On February 15, 1911, I noted a flock of about thirty-five of this species in the southern part of the city, and again on March 8, a flock of upwards of forty.

124. **Vireosylva olivacea.** RED-EYED VIREO.— A rare summer resident, partial to certain localities, in such however its characteristic song can be heard each season.

125. **Regulus calendula grinnelli.** SITKA KINGLET.— Regular early spring and late autumn migrant.

126. **Planesticus migratorius migratorius.** ROBIN.—Among the flocks of Western Robins so common during the winter months, occasionally are seen individuals undoubtedly of this species. In my collection is a perfectly typical specimen of *migratorius* taken in this locality.— S. F. RATHBUN, *Seattle, Wash.*

Professor Whitman's Collection of Pigeons.— Biological investigators will be glad to know that the large and valuable collection of pigeons and birds which were the basis of nearly a score of years' work of the late C. O. Whitman are being maintained and kept together. The material upon which Professor Whitman's extensive evolutional and natural history investigations were made will thus be available while his manuscripts and records are being arranged for publication.

Very abundant material is at hand for a continuance of studies on hybridization, sex, fertility, instinct, etc., more than is now utilized to its full advantage.

Mrs. Whitman has arranged, as long as it is utilized, to keep together this material, priceless from its history, some of the birds having pedigrees reaching back for a long series of years. The collection has been gathered from all parts of the world, not only through long years which consecration to the work could alone have made possible, but also at great expense of money which could be made use of only through sacrifice. Those who know best what this has been feel that the collection must be kept to be utilized as long as it will serve its purpose.

It was only in the last months of Professor Whitman's life that facilities for experiments and observation on a much larger scale were secured through the efforts of friends who put at his service the piece of ground adjoining his residence. He at once had built a large number of new cages; and delighted with the prospect of the enlarged opportunities declared that his real work he was just about to begin and that "five years will show."

For these reasons and because Professor Whitman's work became more illuminating as he went on, his family and friends feel that the opportunities so untimely left should be extended to others who wish them. Quarters are also given in the residence alongside the nearly one thousand birds, and Dr. Riddle, now at work with them, will cooperate with the work of others, or assist, or direct, as needed.

The library, which is one of the largest and most complete of biological libraries, is held open for constant use. The volumes are very extensively marked; pencil notes often bringing together from all quarters the various facts bearing on the subject under discussion.—*Science*, N. S., Vol. XXXIV, No. 866, pp. 145, 146, August 4, 1911.

RECENT LITERATURE.

Mathews's Proposed Changes in the Nomenclature of Birds.—Mr. G. M. Mathews has recently undertaken a revision of the nomenclature[1] of his 'Handlist of the Birds of Australia,' issued in January, 1908. The changes here proposed affect a large number of genera and a considerable number of species, the former including in many instances wide-ranging groups. In the same connection he also discusses incidentally a number of genera that are not Australian. His inquiry has thus a wide scope, and is prosecuted in the hope of increasing stability in nomenclature.

He says (Emu, *l. c.*, p. 317): "I have recognized that the only means of attaining finality in the nomenclature is the acceptance of the laws formulated by the International Congress of Zoölogists." In the 'Handlist' he followed Sharpe's 'Handlist of the Genera and Species of Birds,' and thus took the XIIth instead of the Xth edition of Linné's 'Systema Naturæ' as the "commencing point of binomial nomenclature." Many of his present "alterations" are due to this change. Others are due to his rejection of all generic names founded by non-binomial authors, including upward of forty proposed by Brisson. He gives as one of his "general rules": "*Non-binomial authors have been ignored.*" Among other changes, the number of genera is greatly reduced (in the paper in 'The Emu') by omission as unnecessary, and others, as well as many species, as being extralimital. The greater part of the Brissonian genera are retained, but are accredited to later authors. Emended spellings are also now rejected.

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[1] On Some Necessary Alterations in the Nomenclature of Birds. By Gregory M. Mathews. I. Novitates Zoologicæ, Vol. XVII, Dec., 1910, pp. 492–503; II. *Ibid.*, Vol. XVIII, June, 1911, pp. 1–22.

Alterations in the Nomenclature of 'Hand-list of the Birds of Australia.' By Gregory M. Mathews, F. R. S. E., etc. The Emu, Vol. X, April, 1911, pp. 317–326.

Nomenclature of Australian Avifauna. By Gregory M. Mathews. The Emu, Vol. XI, July, 1911, pp. 52–58.

In Part I of his paper in the 'Novitates' Mr. Mathews assumed that "binary" as used in the International Code of Nomenclature is synonymous with "binomial." Before the publication of his Part II he had received the 'Opinions rendered by the International Commission on Zoölogical Nomenclature' (Opinions 1–25), from which it became evident to him that "'binary' has an altogether different meaning" from binomial. Instead of accepting, however, the ruling of the Commission on the meaning of its own Code he proceeds to argue that the Commission is wrong and that 'binary,' according to dictionaries, is "absolutely equivalent to binomial," and proceeds to affirm his rejection of Brissonian genera! It is hard to reconcile this action with his repeatedly professed absolute adherence to "the laws formulated by the International Congress of Zoölogists." As a matter of fact, it is perfectly evident that the Commission intentionally employed the term binary for the purpose of conserving genera established by non-binominal authors of dates subsequent to 1758 as shown by their ruling (Opinion 20) on the genera of Gronow, and citation of Brisson under *Strix* (Opinion 16, pp. 33 and 38). Furthermore, these rulings foreshadow that if the genera of Brisson are ever brought before the Commission for arbitration their availability will be sustained.

Mr. Mathews, in ignoring Brisson as an author to be reckoned with, introduces confusion in questions of nomenclature that extend beyond the substitution of later authorities for Brisson's genera, as in the case of *Colymbus* and *Podiceps, Catarractes, Penguinus* and *Catharacta*; *Glareola* and *Trachelia*; *Carbo* and *Phalacrocorax*; *Hypsibates* and *Himantopus*; *Nisus* and *Accipiter*; *Curvirostra* and *Loxia*. Unfortunately for Mr. Mathews, his statements in regard to Brisson and *Colymbus* are erroneous, for he says: "Brisson independently introduced *Colymbus* for the Grebes: he never subdivided a Linnean genus; he used the same names as Linné, often with different significations, as for instance *Mergus*, which he used for the Divers though Linné had utilized it for the Mergansers." It is quite true that Brisson used a number of Linné's generic names in a different sense from that in which Linné had employed them, as did nearly every systematic writer of the latter half of the eighteenth century. During this period, and even for the quarter century following, each author took the liberty of doing as he pleased in matters of nomenclature; for the happy thought of a "law of priority" had not then taken form. But it is entirely erroneous to assert that Brisson "never subdivided a Linnean genus," for he did it in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense, but failing to conserve the names of a few of them. If Brisson's genera continue to be used, as they certainly will be, *Podiceps* is properly to be construed as a homonym of

Colymbus (Brisson ex Linné), and *Catarractes*, *Glareola*, *Phalacrocorax*, *Accipiter*, *Strix*, and *Loxia* will continue in use as at present, with the type of *Loxia* as *Loxia curvirostra* Linn., both by restriction (by Brisson) and by tautonymy (through Brisson), under Opinion 16 of the International Zoölogical Commission.

Among other generic names discussed attention may be called to the Linnean names *Charadrius* and *Tringa*. On the basis of tautonymy Mr. Mathews rules that the type of the former is *C. hiaticula* Linn., and of the latter *Tringa ocrophus* Linn. If these premises be granted *Charadrius* will replace *Ægialitis* Boie, and *Pluvialis* (authority Brisson, not *Schæffer*) will replace *Charadrius* of authors; *Tringa* will replace *Helodromas* Kaup, and *Canutus* Brehm will replace *Tringa* of authors. The types of both *Charadrius* and *Tringa* were left in abeyance in Opinion 16 of the International Zoölogical Commission.

Mr. Mathews considers that differences in the gender endings in generic names, as *-a* and *-us*, *-us* and *-um*, etc., do not require the rejection of names otherwise identical, and he would thus employ *Heteroscelus* Baird in place of *Heteractitis* Stejneger, and *Oxyura* in place of *Erismatura*, but in this latter case he states further that *Cerconectes* Wagler "appears to have [slight] priority" over *Erismatura*. *Marila* Oken is rejected in favor of *Nyroca* Fleming, on the assumption that Oken's bird genera of 1817 are untenable.

Œnanthe Vieillot is accepted for the Wheatears in place of *Saxicola* on the ground that the type of *Œnanthe* rested on tautonymy (*Motacilla œnanthe* Linn.) before a type was fixed for *Motacilla*. *Conurus* Kuhl is rejected because "not proposed generically," but merely as the name of a section, Mr. Mathew stating that he refuses "to accept names simply proposed sectionally as of their sectional date" — implying a distinction between section and subgenus, or other subgeneric divisions not definitely indicated as to grade. *Macrorhamphus* Forster is stated to be antedated by *Macrorhamphus* Fisher, which unfortunately is the case.

Chelidon Forster replaces (we believe properly) *Hirundo* auct. nec Linné; *Aluco* Fleming is said to be preoccupied by *Aluco* Link, and that *Tyto* Billberg (not *Tyta* Billberg of earlier date) or *Hybris* Nitzsch is available in its place.

Lack of space forbids mention of many other interesting rulings, some of which appear well-founded while others seems to invite further research.

Various new names, both generic and specific, are given to replace names considered untenable.

As is evident from the foregoing, Mr. Mathews's paper 'On some necessary Alterations in the Nomenclature of Birds,' demands serious consideration, containing, as it does, the results of much research, among its important features (in Part II) being the record from authentic sources of the dates of publication of various works issued in parts or in a series of volumes, as Lesson's 'Illustrations Zoologiques,' his 'Traité d'Ornithologique,' and 'Centurie de Zoologie'; of 'Cuvier's Le Régne Animal,' and of Vieillot's contributions to the 'Nouveau Dictionnaire d'Histoire Naturelle.'

His first-cited paper in 'The Emu' (*l. c.*) gives the results of his nomenclatorial investigations as relating to Australian birds, with, in addition, his views as to the genera to be recognized, and the eliminations of extralimital genera and species. His second paper in 'The Emu' (*l. c.*) gives an explanation of the nomenclature and principles followed by him in the previous papers, for the benefit especially of Australian ornithologists. In this paper he states clearly why the changes he has proposed are necessary. The current nomenclature of Australian birds, being, like his own 'Handlist of Australian Birds,' that of Sharpe's British Museum 'Handlist,' is at many points not in conformity with the now generally accepted International Code of Zoölogical Nomenclature, which he has now adopted. He further makes a strong plea for the recognition of subspecies and the use of trinomial nomenclature, neither of which appear to have yet found much favor with Australian ornithologists. He also explains and advocates the determination of genotypes by "virtual tautonymy," and finally gives his reasons for his extensive reduction in the number of genera he adopts, citing especially *Charadrius* and *Tringa* and their modern subdivisions in illustration. We believe that in this extensive lumping of genera he will not win a large following. A quarter of a century ago the American Ornithologists' Union Committee on Nomenclature took the same view, and reduced a large number of then current genera to subgenera, which, some twenty years later, this same Committee began gradually to reinstate as full genera until in 1910, in the third edition of its Check-List of North American Birds, nearly all the previously rejected genera were reinstated. The Committee's action in 1885 in this matter failed to receive the approval of ornithologists at large, and we feel quite sure that in this respect history will again repeat itself, and that Mr. Mathews and his friend Dr. Hartert will find themselves in a small minority not only in the lumping of genera but in the rejection of Brissonian generic names.— J. A. A.

Hancock's 'Nature Sketches in Temperate America.'— As shown by the full title,[1] this book deals with outdoor life from the standpoint of ecology and evolution, as further indicated by the following transcript of the section headings: I. Evolution and Natural Selection (pp. 1–24). II. Adaptations in Animals and Plants, with examples (pp. 25–64). III. Protective Resemblance, with examples (pp. 65–114). IV. Mimicry, with examples (pp. 115–133). V. Warning Colors, Terrifying Markings, and other Protective Devices, with examples (pp. 135–164). VI. Animal Behavior, with examples (pp. 165–267). VII. General

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[1] Nature Sketches | in | Temperate America | A series of sketches and a popular account | of Insects, Birds, and Plants, treated | from some aspects of their | Evolution and Ecological | Relations | By | Joseph Lane Hancock | M. D., F. E. S. | [illustration]. With two hundred and fifteen original | illustrations in the text, and twelve colored plates by the author | Chicago | A. C. McClurg & Co. | 1911.— 8vo, pp. xviii + 451. $2.75 net.

Observations and Sketches afield, with examples (pp. 269–314). VIII. Ecology — Interpretation of Environment as exemplified in Orthoptera (pp. 315–433). The author says: "This work consists essentially of suggestive essays drawn from observations afield, and treating of various insects, birds, and plants. In this account there is brought together a series of life histories of many animal forms. I have given more consideration here to the insects than to other groups of animals. I think this is justifiable when it is remembered how many more representatives of these animals populate the earth, as compared with other families of animals."

The work will appeal to the general reader interested in nature study through its wide scope, clear and non-technical descriptions, and evident scientific merit. The author is an entomologist of standing, whose special field is the Orthoptera, from which many of his illustrations and examples are drawn. In discussing general questions of evolution he quotes liberally from standard authors, including not only Darwin, Wallace, and Poulton, but the more recent investigators in the field of experimental biology, and current authorities in ecology. It is on the whole a safe guide, replete with original observations, and with illustrations on a liberal scale from the author's own sketches and photographs, and must prove a useful introduction to the study of the animal and plant life of "temperate America." Much of the work is based on studies and observations carried on for many years at Lakeside, Michigan. The ornithological matter is not extensive, consisting mainly of passing references, in the section on 'Animal Behavior,' to various species in illustration of the general subject, and to the Ruby-throated Hummingbird as an agent in the pollination of flowers.— J. A. A.

Curl's 'Notes on the Digestive System of Hydrocorax.' — In an illustrated paper[1] of six pages, the author gives a detailed account of the digestive system in *Hydrocorax hydrocorax* (Linn.), with special reference to the periodical casting-off of the lining of the stomach. This deciduous membrane "is formed by secretion from the glands of the stomach and after reaching its full thickness, separates spontaneously, leaving the glands to begin at once the formation of a new sac .... It seems reasonable to suppose that, at least when the breeding season is past, the food, mixed with, and acted upon by, the secretion of the proventricular glands, passes into the deciduous sac lining the stomach; here muscular action completes the mixing, triturates the food, and prepares the digestible parts to pass over into the duodenum. The refuse is then periodically ejected in the membranous sac. Whether this routine is changed in the breeding season, I cannot say." — J. A. A.

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[1] Notes on the Digestive System of *Hydrocorax*. By Holton C. Curl, Surgeon, U. S. Navy. Philippine Journal of Science, Vol. VI, No. 1, pp. 31–37, pll. i, ii. February, 1911.

Oberholser's Revision of the Ladder-backed Woodpeckers.[1] — This revision is based on the material available for study in the principal museums of the United States, numbering altogether 560 specimens, brought together by Mr. Ridgway for use in the preparation of his 'Birds of North and Middle America.' Under Mr. Oberholser's standard of subspecies "the six currently recognized races are here increased to fifteen." *Dryobates scalaris bairdi* of the A. O. U. Check-List is here treated as extralimital, with the assigned type locality the State of Hidalgo, Mexico. From the old *bairdi* of the Check-List are carved *D. s. symplectus* and *D. s. cactophilus*, the former ranging from southeastern Colorado south through Oklahoma and Texas into eastern Mexico, the latter from southeastern California, Arizona and New Mexico south into the State of Durango. The other seven new forms are from various localities in central and southern Mexico, and Nicaragua. The ranges of all the forms are indicated on an accompanying map.— J. A. A.

Oberholser's Revision of the Hairy Woodpeckers.[2] — This study, the author tells us, was undertaken largely at the request of Mr. Ridgway, and is based on the material he had gathered from the leading museums of this country for use in the preparation of the forthcoming fifth part of his 'Birds of North and Middle America,' the specimens of this group alone numbering 1070. As is well known, the Hairy Woodpecker group ranges from Alaska and northern Canada south to Panama, and comprises many well-marked forms. The fourteen hitherto currently recognized subspecies are here increased to twenty. The name of the Northern Hairy Woodpecker is changed from *Dryobates villosus leucomelas* (Boddaert) to *D. v. septentrionalis* (Nuttall). Boddaert's name was based on Brisson's description of his "Picus varius canadensis" and on D'Aubenton's plate of Buffon's "Epeiche du Canada," the locality being simply "Canada." Mr. Oberholser finding that the measurements given by Brisson and indicated in D'Aubenton's drawing appear to be "altogether too small for the large race of northern Canada," the name *leucomelas* is treated as a synonym of *D. villosus villosus* and replaced by the next available designation, based on birds from the Saskatchewan River. Inasmuch as the range of overlapping individual variation in the length of the wing in the two forms is one third of the average difference between them, and as Brisson's specimens are quite likely to have come from either Quebec or Montreal (Oberholser records specimens of the northern form from as far south as Toronto), it seems by no means evident that the name *mesomelas* might not be properly retained for the northern form.

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[1] A Revision of the Forms of the Ladder-backed Woodpeckers (*Dryobates scalaris* [Wagler]). By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. Nat. Mus., Vol. XLI, No. 1847, pp. 139–159, with map (pl. 12). Published June 30, 1911.

[2] A Revision of the Forms of the Hairy Woodpeckers (*Dryobates villosus* [Linnæus]). By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. Nat. Mus., Vol. XL, No. 1840, pp. 595–621, with map (pl. 70). Published June 3, 1911.

D. v. hyloscopus is restricted to the mountains of southern California and northern Lower California, the birds of the interior formerly referred to it now furnishing material for a new subspecies, *D. v. orius*; while another new subspecies (*D. v. leucothorectis*), is sliced from the southern border of what has been currently recognized as *D. v. monticola*. It is also to be noted that a new Mexican form, *D. v. icastus*, extends into southern Arizona from Sonora, making three new forms of the group for the United States. *D. v. fumeus* is based on specimens collected at San Rafael del Norte, Nicaragua, by Mr. William B. Richardson, for the American Museum of Natural History. The distribution of the twenty forms is conveniently shown on an accompanying map.— J. A. A.

Nelson on a New Hummingbird from Panama.[1] — Among the first fruits of the Smithsonian Biological Survey of the Panama Canal Zone[2] is a new genus and species of Hummingbird, recently described by Mr. Nelson as *Goldmania violiceps*. The species was discovered by Mr. E. A. Goldman, of the Biological Survey, U. S. Department of Agriculture, on the higher slopes of the Cerro Azul, a high mountain at the extreme headwaters of the Chagres River, and the genus is named in honor of Mr. Goldman, who for so many years was Mr. Nelson's assistant in his biological explorations in Mexico. It is allied to the genus *Saucerottea*, but has the median lower tail coverts highly specialized.— J. A. A.

McGregor on Birds of the Philippine Islands.— Mr. McGregor has published recently a number of papers on the birds of various islands of the Philippine Archipelago, to which brief references are here made. His paper on the birds of the island of Polillo[3] is said to be the first contribution to our knowledge of its fauna, and is based on a trip to the island in September, 1909, with two Philippine assistants. It records 101 species as collected or certainly identified, and discusses the ornithological relations of the island to Luzon and the neighboring smaller islands.

Lists of birds from Pauai and Mount Pulog, in the Subprovince Benguet, Luzon,[4] are based on a trip made to these localities in May, June and July, 1909, when 22 species were obtained or noted at Pauai, and 12 at Mount Pulog.

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[1] Description of a New Genus and Species of Hummingbird from Panama. By E. W. Nelson. Smithsonian Miscel. Coll., Vol. LVI, No. 21, pp. 1, 2. Published July 8, 1911.

[2] See *antea*, p. 152.

[3] Birds collected in the Island of Polillo, Philippine Islands. By Richard C. McGregor. Philippine Journ. of Science, Vol. V, No. 2, Sect. D., pp. 103–114. "Issued Oct. 17, 1910."

[4] *Ibid.*, pp. 135–138.

He has also additional notes on birds from northern Mindanao,[1] relating to 7 species, and a note on the migration of the Tic-wee Buzzard [2] (*Butaster indicus*) in the Philippine Islands, which it visits in great numbers in autumn. A plate gives two views of a living bird. There is also in this connection a further installment of his bibliography of Philippine ornithology.[3]

Another paper relates to the birds of Northern Luzon and to those of several neighboring small islands,[4] based on short visits made to the several localities in August, 1909. Owing to the limited time available only a few species were noted at each of eight different points visited.

His 'Notes on a Collection of Birds from Northern Negros'[5] are based on a collection made by Mr. Andres Celestino in February and March, 1909, It includes 55 species, of which four are believed to be here recorded from this island for the first time. A summary of previous papers relating to the birds of Negros forms a useful introduction to the present list.— J. A. A.

Reichenow on African Birds.— The notable activity of Dr. Reichenow in the field of African ornithology is evinced in the three important papers from his pen here under notice. The first is a report[6] on a collection of birds made in the region of the Rio Benito, Spanish Guinea, by Herr Tessmann in 1906–09. The collection numbered 194 species, and the briefly annotated list here given shows the close faunistic agreement of the birds of this region with those of the Kamerun coast region.

The second paper is a report upon a collection of birds made in the interior of Kamerun made by Herr Riggenbach in 1908–09, to which is added a list of all the species thus far known from Kamerun,[7] with the localities at which they have been taken. The collection contained about 1000 specimens, representing 305 species, of which 34, or 10 %, were new (since described by Reichenow in 1910 in Orn. Monatsb.). The annotations include not only the localities and dates of collecting, but often important technical comment on the relationships and ranges of some of the species or subspecies. The appended list of Kamerun birds numbers 660 species, with the localities where each is known to occur.

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[1] Additional Notes on Birds from Northern Mindanao, Philippine Islands. Philippine Journ. of Science, Vol. V, No. 3, p. 197, "Issued Oct. 29, 1910."

[2] Note on the Migration of the Tic-wee Buzzard in the Philippine Islands. *Ibid.*, pp. 199, 200, pl. i.

[3] Philippine Ornithological Literature. *Ibid.*, pp. 203–209.

[4] Birds from the Coast of Northern Luzon and from the Islands of Sabtan and Dalupiri. *Ibid.*, No. 4, pp. 219–221. "Issued Dec. 29, 1910."

[5] *Ibid.*, Vol. VI, No. 1, Sect. D., pp. 39–46. "Issued May 3, 1911."

[6] Über eine Vogelsammlung vom Rio Benito im Spanischen Guinea. Von Ant. Reichenow. Mitt. Zool. Museum in Berlin, V. Band, 1. Heft, March, 1910, pp. 73–87.

[7] Die Ornithologischen Sammlungen der Zoologisch-Botanischen Kamerun-Expedition 1908 und 1909. Mit einer Übersicht aller bis jetzt aus Kamerun bekannten Vogelarten. Von Ant. Reichenow. Mitt. Zool. Museum in Berlin, V. Band, 2. Heft, Jan., 1911, pp. 205–258, with map showing the route of the Riggenbach Expedition.

The third paper[1] relates to the avifauna of the lake region of Central Africa, including the region from Lake Victoria Nyanza west to the chain of lakes stretching from Lake Albert to Lake Tanganyika (about latitude 3° N. to latitude 7° S.). The list numbers 750 species, of which about 130 are West African forms, while 100 are typically East African. About the same number are of general Ethiopian distribution, 20 are typical northern forms, 50 are Eurasiatic migrants or wanderers, while about 200 are peculiar to the region, which is a subprovince of the West African forest region.

The annotations record not only the specimens collected during the expedition, but the general distribution of the forms is stated, with frequent comment on the relationships of some of the less known forms to their nearest allies. The introduction contains a bibliography of papers relating to the region published since 1905, and these and Reichenow's 'Vögel Afrikas' are cited in the text. The two colored plates that accompany this important paper illustrate five of the author's recently described species.— J. A. A.

Mathews's 'The Birds of Australia.'— Part 4[2] of this admirable work bears date "August 9th, 1911," and includes pages 185–234 and plates xlvi–lviii, and treats of Rails and Gallinules (Nos. 50–63). In addition to the usual descriptions and life histories of the species and subspecies, several new forms are here for the first time described, including a new subspecies of *Rallus pectoralis* from West Australia, a new subspecies of *Eulabeornis tricolor* from North Queensland, and seven new subspecies of *E. philippensis*, none of which latter, however, are from Australia. A revision of the *E. philippensis* group is made, of which twelve subspecies are diagnosed. The changes in nomenclature include the introduction for the first time of trinomials for several of the Australian forms of *Porzana*. The excellent plates, all drawn by Keulemans, were evidently printed before the author's recent adoption of his revised nomenclature. The life histories include much hitherto unpublished material, contributed to the author by valued correspondents. The species of Rails for the most part being well-known, the biographical matter is satisfactorily full. In Part 3, dealing with the Pigeons, the scarcity of biographical detail, to which attention was called in our notice of this part, we find was due to the fact that almost nothing is yet known of the life histories of the species thus seemingly neglected. The present Part indicates that the work is to be emphatically revisionary as regards questions of nomenclature and the status of forms belonging to the Australian Avifauna.— J. A. A.

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[1] Die Vogelfauna des Mittelafrikanischen Seengebietes. Auf Grund der Sammlungen Seiner Hoheit Herzogs Adolf Friedrich zu Mecklenburg. By Prof. Dr. Ant. Reichenow. Wissensch. Ergebn. der Centralafrika-Exped. 1907–08 unter Führung des Herzogs Adolf Friedrich zu Mecklenburg, pp. 231–374, pll. vii and viii, colored.

[2] The Birds of Australia. By Gregory M. Mathews, Member of the Australian Ornithologists' Union and the British Ornithologists' Union. With hand-coloured Plates. Volume I. Part 4, pp. 185–234, pll. xlvi-lviii, plus reissue of pp. 183 and 184, here cancelled. August 9th, 1911.

For notices of previous Parts see *antea*, pp. 135, 289, 376.

Pearl on the Relative Conspicuousness of Barred and Self-Colored Fowls.[1]— In this paper are presented statistics of the fowls killed by natural enemies at the Maine Agricultural Experiment Station in 1909. The fowls were Barred Plymouth Rocks, Cornish Indian Games and crosses of these forms. Both the games and crosses were practically self or unicolored birds. The author comments on a note by Davenport[2] to the effect that of 24 chicks killed by crows in one afternoon at Cold Spring Harbor, Long Island, all but one were unicolored. Davenport's conclusion on the acknowledged fragmentary data was that the self-colors of poultry tend to be eliminated by the natural enemies and that pencilled birds are relatively immune from attack because relatively inconspicuous. Doctor Pearl agrees with the final phrase of this conclusion and presents four reproductions of photographs which strikingly illustrate the greater conspicuousness of the unicolored birds, at least under ordinary circumstances.

Davenport's conclusion will comfort those who believe in the protective value of color patterns which render animals inconspicuous to the human eye, but it is based on a single observation which for many reasons may have been misleading. Doctor Pearl however gives the proportions of barred and unicolored fowls among a total of 325, captured in one year by natural enemies from a flock of 3,343 at the Maine Agricultural Experiment Station. The natural enemies were rats, skunks, foxes, crows, hawks, and cats. Of the total number of birds 10.05 per cent were self-colored. Of all the eliminated birds 10.77 per cent were self-colored.

Of the self-colored birds 1.79 per cent were eliminated by recorded enemies (chiefly rats). Of the barred birds 2.26 per cent were eliminated by recorded enemies.

Of the self-colored birds 8.63 per cent were eliminated by unrecorded enemies (chiefly predaceous birds).

Of the barred birds 7.38 per cent were eliminated by unrecorded enemies. In other words, barred and self-colored chickens were captured by natural enemies about in proportion to their total numbers in the flock.

The author concludes that for the time and place under consideration, the relative inconspicuousness of the barred color pattern afforded its possessors no great or striking protection against elimination by natural enemies.

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[1] Am Nat., XLV, No. 50, Feb., 1911, pp. 107–117.

[2] Nature, Vol. 78, 1908, p. 101.

Evidence is accumulating that in the end will overthrow belief in the efficiency of what has been called protective coloration in speculative writings of the past 150 years. Like many other attractive theories that of protective coloration has been unduly elaborated, and facts opposed to it have been ignored. Those who have studied the food of birds, mammals, reptiles, and other groups constantly have the impression forced upon them that the so-called protective adaptations do not protect. Doctor Pearl's results go to confirm the belief that we have been unable to avoid and have often asserted that the influence of natural enemies taken as a whole, is indiscriminate. In other words their food is obtained from the various species they prey upon practically in proportion to the abundance of those species in the state of nature.— W. L. M.

Economic Ornithology in recent Entomological Publications.— In 'The hothouse milliped as a new genus'[1] O. F. Cook says "Prussic acid and other corrosive secretions may aid in the precipitation of colloidal substances in the humus, in addition to the protection that they give by rendering the millipeds distasteful to birds and other animals that might otherwise feed upon them." This statement implies that millipeds have no natural enemies, an Utopian condition probably no organism enjoys. Millipeds are the chief food of certain beetle larvæ, and are greatly relished by toads. They are eaten by armadillos and skunks at least among mammals and the brand of protection their secretions give them against birds is not exactly what men would choose to insure comfort and peace of mind. Records in the Biological Survey show that millipeds are eaten by no fewer than 83 species of United States birds, 36 of which are known to take considerable numbers of them.

Walter E. Collinge begins a new series of economic publications in his 'First Report on Economic Biology'[2] and as usual includes references to the food of various birds. Crane fly larvæ, well known pests of root and cereal crops, are recorded as doing serious injury to bulbs. The bird enemies of these insects include the starling, lapwing, pheasant, various gulls, and the rook. It is of particular interest that one of the shorebirds should be assigned great economic value, as the whole group has recently received that distinction in this country. Collinge says: "All the species of crane flies have increased enormously with the decrease of the lapwing and the same holds true with regard to wireworms and other soil pests."

Mr. Collinge presents a summary of his investigation of the rook, which has previously been reviewed,[3] and a note on the injurious budding of fruit trees by bullfinches. The stomachs of 176 birds collected in April and May, contained nothing but fruit buds, and there is evidence to indicate that damage to young fruit continues through June and July. Aggressive measures against bullfinches are recommended. An increase in the number of voles in the Midland counties is attributed to the ruthless destruction of owls and the kestrel. "It cannot be too widely known that the short-eared owl, the barn owl, and the kestrel feed very largely upon voles and mice and should be protected."

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[1] Proc. U. S. Nat. Mus., 40, 1911, p. 625.

[2] Birmingham, England. 1911, 78 pp.

[3] Auk, XXVII, No. 3, July, 1910, pp. 359, 360.

In a recent bulletin[1] of the Ontario Agricultural College Mr. L. Caesar makes certain statements showing that his experience with bird enemies of the codling moth is in harmony with that of most entomologists who have written on the subject. He says "when searching under bands and loose bark for larvæ in the spring, we have been surprised at the very large percentage that have perished during the winter. Sometimes as high as 90 per cent or more seem to have been destroyed by various causes. The chief of these, so far as we could see were birds, the grub of a small black beetle (*Tenebrioides* sp.) and diseases. Many birds at one time or another during the year feed upon either the adults or larvæ of the codling moth, but during the winter the most useful birds in this respect are the woodpeckers, especially the downy woodpecker and the chickadee. If these two birds are encouraged during winter by hanging bones or pieces of meat on the tree they will often stay in the orchard all year and search every trunk and large branch carefully for larvæ."

D. B. Mackie reports on the locust pest in the Philippines[2] mentioning several birds among the natural enemies. These are cuckoos, crows, small hawks and gallinaceous birds, including domestic fowls. An important paper[3] on the African migratory locusts by Dr. W. La Baume, discusses the natural enemies of several species. Under general remarks on natural enemies, the author says "there can be no doubt that they play an important part in the destruction of the locusts and are a valuable aid to man in the battle against the pests. Deserving especial mention are the 'locust birds,' accounts of whose gratifying work one constantly meets in the locust literature. It is to be commended that legal orders for their protection have been issued in many parts of South Africa, and demanded for them in other districts."

After mentioning the mammalian enemies of the brown locust (*Pachytilus sulcicollis*) Dr. La Baume says: "Of far greater importance as locust enemies are the birds, of which certain kinds in South Africa are significantly called 'locust birds,' because in locust time they persistently follow the migrating swarms and live almost exclusively upon the insects." The principal kinds are: a field swallow (*i. e.*, a swallow-plover or pratincole, *Glareola melanoptera*) known as the "little locust bird"; the jackal-buzzard (*Buteo jackal*), the two storks (*Ciconia alba* and *Ciconia nigra*) generally known as "big locust birds"; the marabou (*Leptoptilus crumenifer*), the blue crane (*Anthropoides paradisea*) the white-bellied stork

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[1] No. 187, Jan., 1911, pp. 24, 25.

[2] Philippine Agr. Rev., III, No. 4, April, 1910, pp. 227–240.

[3] Beihefte z. Tropenpflanzer, XI, No. 2, April, 1910, pp. 65–128.

(*Abdimia adimii*) and a kind of ibis; other enemies are starlings, guinea-fowls, certain bustards, the black and white hornbill (*Buceros leucomelas*), several falcons (*Tinnunculus rupicolis*, *T. naumanni*, *T. rupicoloides*, *Milvus aegypticus*), rooks, plovers, lapwings, shining thrushes, weaver-birds, etc. Most of the birds eat nymphs of the locust as well as the winged form, some dig up the eggs and devour them.

The enemies of the red-winged locust (*Acridium septemfasciatum* are principally the same species that attack the brown locust. The white and black storks and guinea fowls are given special mention. As is the case with the enemies of other migratory locusts, birds rank highest among the vertebrate foes of *Schistocerca peregrina*. Especially in Usambara, wherever locusts were observed, they have been found by flocks of birds. In the mountains, hooded crows, buzzards, marabous and black storks, and on the plains marabous, waders, guinea fowls, and the ground hornbill (*Bucorax caffer*) made themselves useful.

Dr. A. Fredholm gives high credit to the bird enemies of the mole-cricket (*Scapteriscus didactylus*) which is responsible for an annual loss of $15,000 on field and garden crops in Trinidad.[1] He says: "First place among the natural enemies belongs to insectivorous birds. Three of our commonest birds, the savannah blackbird (*Quiscalus crassirostris*), the tickbird (*Crotophaga ani* L.) and the Qu'est ce qu'il dit (*Lanius pitanga*) feed freely on these insects whenever found, and were it not for their persistent hunting, the pests would have committed more extensive depredations in Trinidad than has been the case so far. The birds will not only quickly snap up any insects appearing above the ground, but they will also carefully scrutinise the vaulted top of every burrow they descry for any movement indicating the passage of the insect beneath. As soon as a criket is thus detected they will demolish the roof and drag it out."

Dr. Fredholm is of the opinion also that "The most effective as well as economic method of coping with the pest would undoubtedly be to protect its natural enemies: blackbirds, tickbirds, Qu'est ce qu'il dits, toads and lizards. These are true friends of the planters and it should be seen to that due protection is accorded them."

In a bulletin[2] of the North Carolina Experiment Station on insect enemies of cabbage, Mr. Franklin Sherman, Jr., mentions bird enemies of various pests. In relation to cutworms it is stated that the insect-eating birds "which spend much time on the ground are the most useful, especially the bobwhite, crow, blackbirds, meadowlark, sparrows, catbird, mockingbird, etc. These in the course of a season and especially when rearing their young, pick up many a juicy cutworm." It is not exaggeration to say that cutworms are eaten on sight by practically all birds that glean their food from the ground or from low vegetation. The author remarks that "we know but little about natural enemies of flea beetles . . . .

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[1] Proc. Agr. Soc. Trinidad, XI, part 2, Feb., 1911, pp. 153–163.
[2] Vol. 32, No. 7, July, 1911.

possibly small birds like sparrows would pick a few of them off the cabbage plants, but our information is not very definite or satisfactory." Flea beetles as well as all other Chrysomelidæ, although classed as specially protected insects by supporters of the theories of mimicry and other phases of protective coloration, certainly are eaten by many birds. To cite instances of only a few genera of flea beetles alone, beetles of the genus *Phyllotreta* are at present known to be eaten by 5 species of birds, *Haltica* by ten, *Epitrix* by 12, *Systena* by 21 and *Crepidodera* by 26 species. Mr. Sherman notes a locality where English sparrows usually keep in check the harlequin bug (*Murgantia histrionica*). The same bird also does good work by eating cabbage worms (*Pontia rapæ*).

The larch sawfly (*Nematus erichsoni*) of which there have been serious periodical outbreaks in the United States since 1881, has defoliated thousands of acres of larch or tamarack in southern Canada, Michigan and Minnesota, during the present season. Dr. C. Gordon Hewitt, Dominion Entomologist, gave a lecture on the pest before a meeting of the Canadian Forestry Association in January, 1911,[1] in the course of which he emphasized the normal impracticability of directly combatting the insect. This condition makes the work of natural enemies of paramount importance. In commenting on the results of a study of the sawfly problem in England, Dr. Hewitt gives first rank among natural enemies to a parasitic Ichneumonid. "The chief of the other potent natural causes were the small voles or field mice and the birds, especially the tits." A paper[2] published in England by Dr. Hewitt gives further details regarding bird enemies: "When the larvæ were in the earlier stages it was found that the three species of Tits — the Great Tit, Cole Tit, and Blue Tit — fed upon them to a considerable extent. They were also assisted by Chaffinches, which were found feeding on the full grown larvæ. In addition to these birds, which perform no little service, great destruction of the larvæ was effected by the Rooks, Jackdaws, and Starlings which were to be seen in large flocks in and about the more seriously attacked plantations. They not only fed upon the larvæ on the trees but also followed them on the ground when about to spin their cocoons beneath the turf. When the larvæ had reached this stage one frequently found that the rooks had riddled the turf round the bases of the trees with holes in search of the larvæ."

The natural means of control can be assisted and augmented, "and such is the case with regard to the birds which have been mentioned as feeding on the larvæ; chief of these are rooks, jackdaws, and tits. In the districts where the trees are badly attacked these birds should not be destroyed on any account. The starlings and tits should be encouraged and protected by feeding them during the winter and thus prevent the customary great mortality which results from hard weather, and also by the provision of nest-boxes in the plantations. Larch plantations are singularly devoid of suitable nesting places for birds and they should therefore be supplied. In England these insectivorous birds are not sufficiently encouraged in places where nesting sites are absent by the provision of nesting boxes, the value of which form of forest protection has been recognized for a number of years in Continental forests. The best type of nest-box is that designed by Baron von Berlepsch."

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[1] The Spruce Budworm and Larch Sawfly. Kingston, Ont., 1911. 8 pp.

[2] Reprint from Journ. Bd. Agr., [London], XV, No. 9, Dec., 1908, 12 pp.

In the Canadian paper Dr. Hewitt gives the results of actual trial of this system of bird encouragement. "Nest boxes were distributed, an additional number being provided each year. Last year there were nearly 300 boxes and over 50% of these were occupied which indicates a considerable increase in the number of birds in view of the scarcity previous to their encouragement. Such a system of bird protection .... is carried on in Europe not only by individuals but also by those states in which the forests are important natural resources." Dr. Hewitt is strongly of the opinion that "If the natural means of control, such as birds, are encouraged and it is upon these and the parasites that the extermination of the pest chiefly depends, the attack will last for a much shorter length of time, and there will ultimately be less pecuniary loss than if a policy of *laisser faire* be adopted."

It is of interest in this connection that Mr. Vernon Bailey of the Biological Survey observed cuckoos and red-eyed vireos feeding on larvæ of this sawfly at Elk River, Minn., in July of the present year. Birds of several other species were abundant in the infested region. Stomach examinations show that the ruffed grouse, bobolink and least flycatcher feed upon this or closely related larvæ, and the range of these birds makes it probable that they will prove to be fond of the larch sawfly larvæ.— W. L. M.

An Australian Bird Book.[1] — The interest in ornithology in Australia, which resulted in the formation of the Australasian Ornithologists' Union in 1900, now finds its logical development, through the added stimulus of coöperative effort, in the publication of works on Australian birds designed to meet the wants of bird students of every class. Thus Mr. Gregory M. Mathews is producing an elaborate folio with colored plates, of which four parts have thus far appeared; Messrs. Lucas and Le Souëf have recently published a more convenient work, while the present volume "is intended as a pocket-book for field use, so that the many teachers, nature students, nature-lovers, schoolboys, schoolgirls and boy scouts who like to '*see* what they *look at*' may be able to name the birds they meet."

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[1] An Australian Bird Book. A Pocket Book for Field Use. By J. A. Leach, M. Sc. With Introduction by Frank Tate, M. A., I. S. O. Published by Arrangement with the Education Department of Victoria. Melbourne, Whitcombe and Tomb Limited. 1911. 12mo., pp. 200. Numerous colored and half-tone figures. Price 3/6.

Both as regards text and illustrations the author has shown excellent judgment in using the necessarily limited space at his command to the best advantage. Every one of the 395 species treated appears to be figured, many of them in colors. These illustrations were made from mounted specimens and if one must admit that they do not represent the highest type of taxidermy, at least they are useful.

As organizing inspector of nature study of the education department of Victoria, Mr. Leach is familiar with his audience and its special needs, and he has evidently supplied them satisfactorily and in a manner which should do much to promote bird study and bird protection in Australia.— F. M. C.

'Bird Stories from Burroughs.' — This small volume[1] has been gathered from Mr. Burroughs's books, dating from 1871 to 1909, and consists of chapters on about thirty species of the best known birds of the Northeastern States. A chapter is given to each species, and the "chapters are arranged in a sort of chronological order," according to the time of the bird's arrival in spring, or with reference to the season when the species is particularly conspicuous. Hence the Bluebird, Robin, Flicker, and Phœbe head the list, which includes the Crow, Whip-poor-will, two hawks, the Screech Owl, Ruffed Grouse, Chickadee, and some twenty other species which have been subjects of the author's special attention. The selections include also six of his bird poems. It is unnecessary to commend Mr. Burroughs's bird stories: the warm welcome they have always received is sufficient guaranty that the present selection from them will meet with a cordial reception. The eight beautiful drawings, four of them in color, of some of our best loved birds, by Mr. Fuertes, add greatly to the attractiveness of this little volume.— J. A. A.

McAtee's 'Local Names of Water-fowl and Other Birds.'.— In a brochure of 24 pages,[2] reprinted from 'Forest and Stream,' Mr. McAtee gives local names for 96 species, 61 of which are game birds (ducks, geese, and shorebirds), and the others various non-game birds, of which 16 are passerine birds. These names are mainly additional to those given by Trumbull in his 'Names and Portraits of Birds' (1888), and are compiled in part from 'The Auk' and other published sources, but chiefly from the author's own notes taken during field work made under the auspices of the Biological Survey in North and South Carolina and the Gulf States. "The principal additions now made to Trumbull's lists," says the author,

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[1] Bird Stories | from Burroughs | Sketches of Bird Life | taken from the works of | John Burroughs | With Illustrations by | Louis Agassiz Fuertes | [Seal] Boston and New York | Houghton Mifflin Company | The Riverside Press — (No date = Sept., 1911.) 12mo. pp. viii + 174, pll. 8, 4 colored. 60 cents net.

[2] Local Names of Waterfowl and Other Birds. By W. L. McAtee, Biological Survey, Washington, D. C. 24mo, 24 pp., reprinted from 'Forest and Stream,' issue of July 29, 1911, pp. 172–174, 196, 197.

"are the French names, their translations, or the French and English combinations in use among the gunners of southern Louisiana."

Citations of localities where a name is used follow the name. A name index concludes this valuable contribution toward a more complete glossary of game bird local names.— J. A. A.

Game Protection in the United States.— The last annual review of game protection in the United States[1] notes "the steady progress in the movement for the increase of game by propagation and the establishment of game preserves"; the condition of the different species of game as to increase or decrease in 1910; game conditions in the National parks and game refuges, National bird reservations, State game preserves, and private game preserves; statistics of the importation of foreign game birds for stocking purposes; State game farms; protection of non-game birds; meetings of game and bird protective associations; administration and enforcement of game laws; legislation and court decisions affecting game and bird protection. It contains also a convenient 'Chronological Record of Game Protection for 1910.' The legislation in 1910 resulted in the passage of few laws affecting game protection; among them were several of importance, but most of them dealt with minor regulations affecting the limits of open seasons, bag limits, licenses, export of game, sale of game, etc. The court decisions were generally favorable to the constitutionality of contested game laws, including the right of a State to regulate the kinds of guns used in hunting game, even to the use of the automatic gun and the gun silencer.

Another brochure of interest in relation to game protection is 'The Game Market of To-day,'[2] which shows the rapid decrease of game in this country with the increase of population. "From a time when bounties were paid for [the destruction of] ruffed grouse and apprentices appealed from a diet of prairie chicken, we have reached a time when ruffed grouse are within the reach only of the rich and prairie chickens are not to be had at any price. The meat of all big game except deer has been withdrawn from the market, and in many large cities even deer are not in the market, either because of nonsale laws or owing to the limited supply. Rabbits and waterfowl are still offered in some numbers, and quail are on sale every open season in a number of cities; but wild turkeys, once so abundant that colonists shot them from their doorways, are rare in northern markets and are found in very limited quantities in the South; while native woodcock and other shore birds are sold only in small numbers, if at all. The period has arrived when European pheasants, grouse, and plover are rapidly replacing corresponding American birds; and unless suitable measures be adopted for preserving and increasing our own game, we shall doubtless have to depend more and more on imported game for our market supply."

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[1] Progress of Game Protection in 1910. By T. S. Palmer and Henry Oldys, Assistants, Biological Survey. United States Department of Agriculture, Bureau of Biological Survey — Circular No. 80. Henry W. Henshaw, Chief of Bureau. Issued June 29, 1911. 8vo, pp. 36.

[2] The Game Market of To-day, by Henry Oldys, Assistant Biologist, Biological Survey. Yearbook Depart. Agriculture for 1910, pp. 234–254.

The present scarcity of game is compared with its former abundance, and the cause of the decrease is traced to the recklessness of the early colonists and their pioneer successors in the settlement of the country, to the conversion of wild into cultivated land, and to unrestricted trade in game, aided by modern cheap rapid transit and cold storage. The present prices of game here and in Europe are compared, and also the cost in this country of European grouse, plover, etc. in comparison with the far greater cost of American game of similar character. "The principal reason for this apparent anomaly is," it is stated, "that the European game markets are largely supplied by private preserves, which are comparatively few in number and near the market, and which can maintain their stock at a fairly constant point; while the American supply is obtained from distant and numerous sources and is derived from wild and practically unregulated stock.... Free marketing of wild game leads swiftly to extermination, while game reared as private property may be marketed freely without reducing stock."— J. A. A.

Cooke on Migration Routes of North American Birds.[1] — Prof. Cooke states: "The Bureau of Biologic Survey of the United States Department of Agriculture has collected much information on the migration of North American birds, and this article is an attempt to put in popular form some of the data that have already appeared in the more technical bulletins and reports."

A number of outline maps effectively illustrate the text. The seven principal migration routes used by North American birds in their migrations to and from South America are thus graphically shown. We are warned against supposing that "these routes as outlined on the map represent distinctly segregated pathways. On the contrary, they are merely convenient subdivisions of the one great flightway which extends from North to South America. There is probably no single mile in the whole line between northern Mexico and the Lesser Antilles which is not crossed each fall by migrating birds." The great bulk of the land birds, both as to species and individuals, cross the Gulf to eastern Mexico, while two less important routes run from Florida through the West Indies to South America. The species of the western United States whose migrations are, on the whole, much less extensive, follow two main routes to their winter homes in Mexico.

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[1] **Our Greatest Travelers: Birds that fly from Pole to Pole and Shun Darkness: Birds that make 2,500 Miles in a Single Flight. By Wells W. Cooke, of the Biological Survey, U. S. Department of Agriculture. National Geographic Magazine, April, 1911, pp. 346–365, 6 maps.**

Nine interesting species are taken up in detail and their migration routes described and plotted. The extremes of direct and circuitous routes are exemplified by the Black-poll Warbler and the Cliff Swallow respectively. The two races of the Palm Warbler travel by wholly different routes to and from their winter homes. (The author, however, omits to state for the benefit of the general reader, that the Palm Warblers belong to two quite distinct subspecies). The migration line of the Eastern form is from northeast to southwest, while that of the Western race runs from northwest to southeast, the two lines crossing at right angles in Georgia.

The Connecticut Warbler on its southward flight in the fall follows a wholly different path from that by which it reached its breeding grounds in the spring. An elliptical route such as this is rare among land birds but is followed on a far larger scale by a number of water birds of which the Golden Plover is here taken as an example.

The greatest traveler of all is the Arctic Tern, which breeds in the Arctic regions and winters in the Antarctic, and in its annual wanderings between these two points must cover over 22,000 miles. The northward migration of the Robin is of interest as it keeps pace with the advance of spring, and the Robins of the Pacific side of the continent travel at a much more rapid rate than those of the Atlantic slope and the interior. A very narrow path from the United States to South America is followed by the Scarlet Tanager; while the Bobolink deserves special mention as it is extending its range towards the Pacific coast, thereby lengthening its route of migration.

Prof. Cooke also endeavors to trace the evolution of the present remarkable migration lines of the Golden Plover and maps the hypothetical routes of earlier times.— W. DeW. M.

Beal on the Food of Woodpeckers.[1] — This paper gives the results of the stomach examination of 3500 woodpeckers, representing 22 species. The number of individuals of each kind examined ranges from one of the Gila Woodpecker and two of the Ivory-bill to 684 of the Flicker and 723 of the Downy Woodpecker.

The Red-headed, Hairy and Red-bellied Woodpeckers and the Yellow-bellied Sapsucker are each represented by more than 270 specimens. As the individuals of these six species were taken throughout the United States range of each, representing many subspecies, and in every month of the year, the material is ample on which to base conclusions as to their economic value. With most of the remaining species, while the results are less conclusive, at least the general character of their food is well shown.

In the genera of the *Melanerpes* group the percentage of vegetable food exceeds that of animal, in *Picoides* and *Dryobates* the animal food greatly exceeds the vegetable part of the diet. The Pileated Woodpecker, the Flickers and the Sapsuckers, with the possible exception of *S. thyroideus*, are more or less intermediate in this respect.

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[1] Food of Woodpeckers of the United States. By F. E. L. Beal, Assistant, Biological Survey. Biological Survey Bull. No. 37. 8vo, pp. 64, with 6 colored plates and 3 text cuts. May 24, 1911.

Ants constitute the largest item of animal food, taking all the species collectively, and are actually the largest item in eight species. The smallest numbers are consumed by the Three-toed Woodpeckers and the members of the *Melanerpes* group. Beetles rank next in importance, and these two items combined constitute nearly one-half of the total food.

The vegetable food consists almost wholly of fruit, cambium and mast. Cambium is eaten chiefly by the Sapsuckers, while beech nuts are an important article of diet with the Red-head, and acorns form more than half the food of the California Woodpecker.

Prof. Beal concludes that the Sapsuckers are the only injurous species of the family in the United States, their damage to timber due to their fondness for cambium and sap being extensive and serious. The two species of Three-toed Woodpeckers are of particular value in our northern forests for their destruction of wood-boring coleopterous larvæ. The Downy Woodpecker is also one of the most useful species, its only fault, shared by several other Woodpeckers, being the dissemination of the seeds of poison ivy and poison sumach.

Each of the two stomachs of the Ivory-billed Woodpecker examined contained many destructive wood-boring larvæ. As the author says: " These powerful birds are able to reach wood-boring grubs in places where smaller species fail, and their large bodies require a great quantity of such food"; and further: " When we see how much good this woodpecker is capable of doing as a guardian of the forest, it seems deplorable that it should be allowed to be exterminated. Wise legislation, backed by intelligent public opinion, may retard, if not absolutely prevent, the present destruction and allow the bird to regain something of its former abundance. There is plenty of room for this splendid species and much need of its services in the great southern forests."

Colored plates by Fuertes, illustrating seven species, add to the usefulness of this valuable report.— W. DeW. M.

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CORRESPONDENCE.

Cooke's 'Distribution and Migration of North American Shorebirds.'

EDITORS OF 'THE AUK': —

Dear Sirs: —

I feel it my duty to call attention to some rather important omissions in the list of sources for Prof. W. W. Cooke's valuable and for the most part admirable report on the 'Distribution and Migration of North American Shorebirds,' issued as Bulletin No. 35 of the Biological Survey (1910). This report contains the statement by the Chief of the Survey that " a knowledge of the summer and winter abodes of the several species and of the routes they take in migration is essential to intelligent legislation in their behalf, and, accordingly, *all the known facts in regard to this part of their life history are here brought together* " (the italics are mine); and the author, Prof. Wells W. Cooke, states that " the data on the breeding and wintering of the shorebirds has been collected from all available printed sources," as well as from other sources named. The author's statement as to the dates of migration is that they " have been obtained principally from the migration schedules sent in by the several hundred observers in the United States and Canada, who for a quarter of a century have contributed to the Biological Survey spring and fall reports of their observations." It seems natural to infer that in the case of the migration data, as with the breeding and wintering, the printed sources would be consulted.

Now, without attempting a thorough investigation of the field, I find that three publications of some importance seem to have entirely escaped the attention of the compiler. These are 'The Birds of Essex County, Massachusetts,' by Charles W. Townsend, Nuttall Ornithological Club, 1905; 'The Birds of the Cambridge Region,' by William Brewster, Nuttall Ornithological Club, 1906; and 'Birds of Labrador,' by C. W. Townsend and Glover M. Allen, Boston Society of Natural History, 1907. It may seem almost incredible that these three publications, which must be recognized as absolutely authoritative in their respective fields, could have been overlooked, but an examination of the report proves conclusively that such is the case. A consultation of Townsend and Allen's 'Birds of Labrador,' for instance, would have informed Professor Cooke that the Northern Phalarope is a common summer resident in Labrador and breeds along the entire coast and that Turner's Ungava Bay record is by no means the only one for the peninsula, Audubon, Low, Bigelow, and Spreadborough having found the bird there, as well as Townsend and Allen. Mr. Brewster's 'Birds of the Cambridge Region,' too, would have furnished in its record of Feb. 13, 1890, an earlier date for the Woodcock's arrival than Professor Cooke's earliest for eastern Massachusetts, Feb. 22, 1902. Moreover Cooke gives no fall dates for the Woodcock in Massachusetts, while Brewster gives November 10 as the average date of departure and December 13 as the latest. So in the case of Wilson's Snipe, Cooke gives no dates for spring departures in Massachusetts and no fall dates for that State, all of which he might have obtained from 'Birds of the Cambridge Region,' besides getting an earlier date for the spring arrival. The Pectoral Sandpiper is known to Massachusetts ornithologists and sportsmen as an abundant fall but rare spring migrant, and is so characterized in 'The Birds of Essex County.' Cooke, however, says nothing of its rarity in the East in spring, simply stating that it "has a very pronounced southeastward migration in the fall," and that "it is a common migrant throughout the whole of North America east of the Rocky Mountains." For the Spotted Sandpiper Cooke's latest date for eastern Massachusetts is October 14, while Brewster has November 1 and Townsend November 14. The Cartwright records of the Eskimo Curlew given in 'Birds of Labrador' are very full and interesting, covering the dates from July 28 to October 24. These, of course, are omitted from Mr. Cooke's report, which gives only two records of the bird for Labrador, the regular point of departure of the species on its southern migration! Of the Golden Plover, Cooke says that it appears not infrequently at Cape Cod and Long Island. As a matter of fact the species is not extremely rare on other parts of the Massachusetts coast. Townsend's dates for Essex County are Aug. 23–Nov. 2. Cooke misses the second record of Wilson's Plover for Massachusetts, — that of one found by Dr. Townsend in a gunner's bag at Ipswich, May 8, 1904,— and says that it "has wandered once to Massachusetts."

These notes are only fragmentary, but they are sufficient, I think, to show that Professor Cooke's paper on the distribution and migration of the Shorebirds must be regarded simply as an analysis of the official data of the Biological Survey supplemented by the records of the National Museum and by *some* reference to the literature, and not, as we are led to expect, a full statement of "all the known facts in regard to this part of their life history." Valuable as they are, it is much to be regretted that these studies were not made complete within their limits; and while we must be grateful to Professor Cooke for bringing these data together and publishing them for the benefit of ornithologists, legislators, and the public in general, it is well to know just what they are and what they are not.

Yours very truly,

West Roxbury, Mass. FRANCIS H. ALLEN.
Aug. 29, 1911.

NOTES AND NEWS.

Dr. Adolf Bernhard Meyer, an Honorary Fellow of the American Ornithologists' Union, died in Berlin February 5, 1911, at the age of 71 years. He was born in Hamburg in 1840, and received his education as physician and naturalist in Berlin. In 1874 he was appointed Director of the Royal Museum of Zoölogy, Anthropology, and Ethnography at Dresden, which position he held for thirty-two years, resigning from it in 1896. He spent a number of years as a successful explorer and collector in the Eastern Archipelago, passing three years (1870–73) in the Celebes and visiting New Guinea and the Philippine Islands, this expedition resulting in his great work 'On the Birds of Celebes and the Neighboring Islands,' published in two quarto volumes in 1898, in joint authorship with L. W. Wiglesworth, his English assistant in his explorations (reviewed in this journal, XVII, Oct. 1900, pp. 399–401). His principal other general ornithological work was his 'Abildungen der Vogel-Skeleten,' in two quarto volumes with over 200 plates (1879–97), but his minor ornithological papers are very numerous, many of them important, and all characterized by care and accuracy. He also published many anthropological papers, based largely on his work in the Eastern Archipelago. He was also an able museum director and greatly advanced the growth and efficiency of the Dresden Museum, so long under his management. His invention of the famous 'Dresden Case,' of glass and iron, after long study, has met with wide approval, it having been adopted in many other museums. His later years were devoted to linguistic and anthropological research. His scientific attainments won for him wide recognition, he having been made an Honorary or a Corresponding Member of a large number of the learned societies and academies of the world.

Readers of 'The Auk' will be interested in the following editorial statement that will appear in the October issue of 'Bird-Lore' respecting the long-continued illness of Mr. William Dutcher, formerly for many years the zealous and efficient Treasurer of the A. O. U., who was stricken with paralysis in October, 1910 (see *antea*, p. 151):

"On October 15, 1911, a year will have passed since the National Association of Audubon Societies was robbed by illness of the guidance and counsel of its President and Founder, William Dutcher. During this period, Mr. Dutcher has lain helpless and speechless at his home at Plainfield, New Jersey. His mental faculties, at first dimmed by the blow which fell so suddenly, were subsequently restored to him, and he not only recognizes, but welcomes gladly, those of his friends who are privileged to see him.

"As the leader of a great movement, the remarkable success of which is due to his untiring, unselfish, broad-minded efforts more than to those of any other man, Mr. Dutcher won the admiration and respect, not only of his friends and associates, but even of those whom he felt it his duty to prosecute for violations of the law to the support of which his life is pledged.

"Deserving, however, as he was of the place he filled while in the full enjoyment of health and during a life of extraordinary activity, he never was more worthy the esteem of the friends or foes of bird protection than at this moment when, with almost more than human fortitude, unbroken by a year of sore trial, he faces the future with the patience and courage of a truly brave man."

Notwithstanding some unexpected delays, and a shorter time for the work, than was anticipated, the ornithological results of Mr. A. C. Bent's (see *antea*, p. 292) expedition to the Aleutian Islands were important in the amount of material obtained and in opportunities for field work. A delay of three weeks at Seattle, Washington, gave opportunity for collecting a good series of the local birds, including three specimens of the rare Northern Spotted Owl. Another delay in starting for the north prevented the expedition from reaching Unalaska till June 4, and its vessel, the U. S. Revenue Cutter 'Takoma,' was detailed early in July to the Bering Sea patrol. This left only a little more than three weeks in which to make the 1600 mile trip out to Attu Island and return. During the trip, however, collections were made at Akim, Amaknak, Unalaska, Atka, Kiska, Attu, Tanaga, and Adak islands, four or five days being spent at each. About 200 specimens of Ptarmigan were obtained (among them a new form), and good series of the land birds, including two species, Asiatic stragglers, new to the North American list, and one specimen of the rare Fisher's Petrel. On July 3, Messrs. Bent, Beck, and McKechnie sailed north on the gasolene schooner 'Polar Bear,' leaving Wetmore at Unalaska to visit Unimak Island and then work slowly homeward along the south side of the Alaska Peninsula, while Bent and his party visited the Pribilof Islands and went thence north to St. Matthew and Hall islands. They passed the famous volcanic island, Bogoslof, swarming with colonies of Pallas's Murre. They reached Nome July 11, where the party remained collecting for a week, when Bent and McKechnie returned to Seattle, leaving Beck to continue the work there till September. By the middle of July about 1000 birds had been collected, with Beck and Wetmore still in the field.

We are indebted to Mr. E. A. Goldman of the Bureau of Biological Survey for the following statement of progress in the Biological Survey of the Panama Canal Zone (see *antea*, p. 152), from which it appears that the field work has been practically finished. Mr. Goldman reports as follows:

"On December 22, 1910, I sailed from New York for Panama where I was engaged until the latter part of June on the Biological Survey of the Canal Zone which is being carried on by the Smithsonian Institution.

Landing at Cristobal in the Canal Zone, December 28, I proceeded to Culebra, the administrative headquarters for the construction of the Panama Canal. The survey received the active assistance of the Isthmian Canal Commission, and through the courtesy of the Chairman I was assigned comfortable quarters at Gatun. This point was at once chosen as the most favorable base for work in the Gatun Lake area, in which it seemed especially important to secure representative natural history collections before further biological changes incident to the canal construction had taken place. From this convenient base, where my Costa Rican assistant usually remained to prepare specimens, daily excursions were made into the surrounding country, or to more distant points along the line of the Panama Railroad. The Chagres River and some of its tributaries were explored by canoe, and in March an overland trip was made from the Pacific coast into the mountains near the headwaters of the river. The latter part of May and part of June were spent at Porto Bello, on the north coast, and in the mountains near.

"The field work of the season resulted in a collection of nearly 2500 birds and mammals, and other material for use in a general report on the fauna of the region.

"Other members of the survey — Dr. S. E. Meek, Mr. S. F. Hildebrand, Dr. E. A. Schwartz, Mr. August Busck and Mr. W. R. Maxon — have also returned and report good success in their respective branches of the work. Mr. Henry Pittier expects to continue botanical work in the field until about the first of December."

The British Ornithologists' Union Expedition to New Guinea has been given up, owing to the impossibility of reaching the snowfields by the supposed most advantageous route, and the exploring party has returned to England. Its collection of 2300 skins of New Guinea birds has reached the South Kensington Museum, together with 200 bird skins collected in Borneo and about 450 obtained in Ceram.

According to a recent announcement in 'The Emu' (X, Dec., 1910, p. 155) the name of the Australasian Ornithologists' Union has been changed, to Royal Australasian Ornithologists' Union, thus obviating any possible confusion in the use of the initials "A. O. U." for two organizations of similar character, one in North America, the other in Australia.

We learn from 'The Ibis' (July, 1911, p. 580) that Lord Bradbourne and Mr. Charles Chubb, of the Zoölogical Department of the British Museum, have undertaken the preparation of a new work on the Birds of South America. "When completed it will consist of sixteen volumes of quarto size illustrated by coloured plates drawn by Grönvold. The first volume will contain a List of the Birds of South America. This is well advanced. Volume II, containing the first portion of the general work, will be issued early in 1912, and subsequent volumes at intervals of about nine months, each volume consisting of about 300 pages and of from 25 to 30 plates."

AT THE Annual General Meeting of the British Ornithologists' Union held May 10, 1911, it was voted: "That the Committee [=Council] consider it desirable that a new edition of the Union's List of British Birds be prepared, and that a Special Committee be appointed with a view to preparing the same." It was further voted that the President (F. Du Cane Godman), the Editors (P. L. Sclater and A. H. Evans), and the Secretary (J. Lewis Bonhote), Mr. W. R. Ogilvie-Grant, Mr. H. E. Dresser, Mr. W. Eagle-Clark, and Dr. N. F. Ticehurst, be requested to act on this Committee." The original B. O. U. 'List of British Birds' was published in 1883, three years before the first edition of the A. O. U. Check-List was issued, or twenty-eight years ago. The new edition doubtless will be awaited with great interest not only by British ornithologist, but by ornithologists at large.

A COMMITTEE of the Linnæan Society of New York has recently taken over the work of tagging birds for future identification as an aid in studying the migrations and other movements of birds, and in further prosecution of the work has issued the following explanatory circular:

New York, September 18, 1911.

TO ALL MEMBERS OF THE A. O. U.:

You are probably aware of the existence of the AMERICAN BIRD BANDING ASSOCIATION, which was organized in 1909 to encourage the marking of individual wild birds for the purpose of recording accurate data on their movements. The method employed is the placing of inscribed metal bands on the legs of any birds, young or old, that can be captured unhurt, and setting them free again with the realization that if ever the bird should be recovered a definite knowledge of its travels would be obtained.

The great value and ultimate possibilities of the scheme have been well set forth in the reports already published (Auk, XXVI, April, 1909, pp. 137–143, and Auk, XXVII, April, 1910, pp. 153–168); and great credit must be accorded the Committee formerly in charge for the splendid results achieved. The members of that Committee, however, by reason of pressure of other duties, and of being distantly separated from one another, have been unable of late to give the attention they desired to the American Bird Banding Association, and have expressed a wish to have this work placed in other hands. The Linnæan Society of New York, having the advantage of a centralized membership, and of the American Museum of Natural History as a bureau for the return and keeping of records, tendered its services, which were accepted.

Only by the coöperation of a large number of ornithologists in the task of bird marking can real advance ever be made in solving many of the commonest questions of bird migration; the efforts of a few can never avail much. We are therefore endeavoring to interest all bird lovers in the importance of the work. The limited funds secured by the former Committee have been almost exhausted, and we estimate that the sum of $500 should be raised at once. This will place the affairs of the Association on a substantial basis and enable the work to be pushed as its scientific importance demands, and as it is already being pushed in many countries of Europe.

We believe that you appreciate the value of the work we have undertaken, and we appeal to you for your coöperation and for a contribution to the fund.

Please make checks payable to Howard H. Cleaves, Secretary-Treasurer, and mail to Public Museum, New Brighton, New York City.

Respectfully yours,

Committee in charge of Bird Banding
William Wright Grant.
Clinton G. Abbott.
Howard H. Cleaves, Sec'y-Treas.
Public Museum, New Brighton, N. Y.

The criticism has repeatedly been made that the present volume of 'The Auk' does not conform strictly to the third edition of the Check-List, in respect to the use of trinomials for *all* subspecies. In almost all cases the Editor has followed the preference of the contributors as indicated in their manuscripts, believing that no ambiguity would result where the accompanying vernacular name and the geographical area concerned render it evident that only the eastern form of a group of subspecies can be intended. In the case of the Robin, Bluebird, Song Sparrow, Lincoln's Sparrow, Tree Sparrow, Fox Sparrow, Meadowlark, Purple Martin, Cardinal, Yellow Warbler, the various species of Wren (House, Winter, Carolina, Bewick's, etc.), Chickadee, and in a great number of other instances, it seems needless, not to say pedantic, to burden the text with the full form, as in *Planesticus migratorius migratorius, Sialia sialis sialis, Melospiza melodia melodia, Passerella iliaca iliaca, Sturnella magna magna, Thryophilus ludovicianus ludovicianus*, etc., in casual references or informal mention of birds, or even in local lists, when the locality is in the Eastern or Middle States, where no other form of the species occurs. In the case of intermediate districts, or from the eastern border of the Plains westward, where two or more forms of a species may occur, it is obvious that the full form of the technical name should always be used, and of course in all systematic works and technical papers. This is an explanation, not a dictum nor a defense.

The Seventh Annual Meeting of the National Association of Audubon Societies will be held at the American Museum of Natural History, New York City, October 31, 1911. In addition to the election of officers and the transaction of other routine business, arrangements have been made for a 'Nature Study Symposium,' at which addresses will be given by prominent Nature Study teachers, with exhibits of specimens and of methods of instruction; also of artificial nesting-sites and other devices for the preservation and increase of birds.

THE TWENTY-NINTH STATED MEETING of the American Ornithologists' Union will be held at the Museum of the Academy of Natural Sciences at Philadelphia, beginning on the evening of November 13, 1911. The evening session will be a business meeting for the election of officers and members, and for the transaction of routine business. Tuesday and the following days of the meeting will be for the presentation and discussion of scientific papers and will be open to the public. Members intending to present communications should forward the titles to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than November 8, in order that the program of papers may be duly prepared.

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ERRATA.

Page 8, line 11, for **Merganser serrator** read **Mergus serrator**.

" 8, " 39, for **hyperborea** read **hyperboreus**.

" 10, " 40, for **Carthartes** read **Cathartes**.

" 12, " 27, for **saya** read **sayus**.

" 38, " 15, for **Phalænoptila** read **Phalænoptilus**.

" 136, " 27, for E. E. Lodge read G. E. Lodge.

" 150, " 39, after 1901 add, when he was transferred to the class of Members.

" 150, " 44, for Ecstorm read Eckstorm.

" 152, " 9, for S. H. Rhoads read S. N. Rhoads.

" 265, " 13, after immaturity add, or a female.

" 291, " 7, for Shelly read Shelley.

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